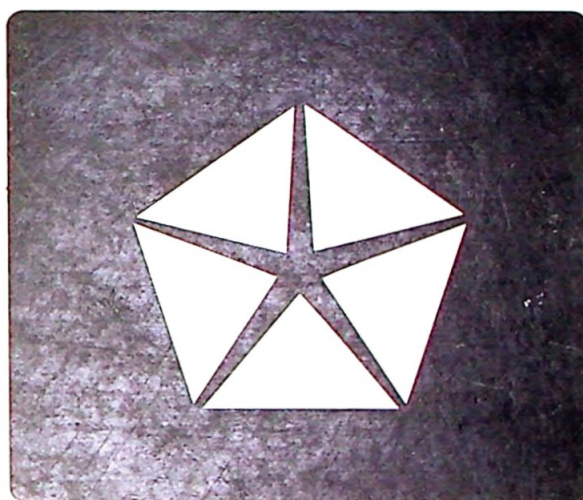


Jeep[®] Cherokee



POWERTRAIN DIAGNOSTIC PROCEDURES

CAUTION

ALL SERVICE AND REBUILDING INSTRUCTIONS CONTAINED HEREIN ARE APPLICABLE TO, AND FOR THE CONVENIENCE OF, THE AUTOMOTIVE TRADE ONLY. All test and repair procedures on components or assemblies in non-automotive applications should be repaired in accordance with instructions supplied by the manufacturer of the total product.

Proper service and repair is important to the safe, reliable, operation of all motor vehicles. The service procedures recommended and described in this publication were developed for professional service personnel and are effective methods for performing vehicle repair. Following these procedures will help assure efficient economical vehicle performance and service reliability. Some of these service procedures require the use of special tools designed for specific procedures. These special tools should be used when recommended throughout this publication.

Special attention should be exercised when working with spring or tension loaded fasteners and devices such as E-Clips, Circlips, Snap rings, etc., as careless removal may cause personal injury. Always wear safety goggles whenever working on vehicles or vehicle components.

It is important to note that this publication contains various Cautions and Warnings. These should be carefully read in order to minimize the risk of personal injury, or the possibility that improper service methods may damage the vehicle or render it unsafe. It is important to note that these Cautions and Warnings cover only the situations and procedures Chrysler Corporation has encountered and recommended. Chrysler Corporation could not possibly know, evaluate, and advise the service trade of all conceivable ways that service may be performed, or of the possible hazards of each. Consequently, Chrysler Corporation has not undertaken any such broad service review. Accordingly, anyone who uses a service procedure, or tool, that is not recommended in this publication must assure oneself thoroughly that neither personal safety, nor vehicle safety, be jeopardized by the service methods they select.

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NOTES

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1.0 INTRODUCTION

The procedures contained in this manual include specifications, instructions, and graphics needed to diagnose the PCM Powertrain System. The diagnostics in this manual are based on the failure condition or symptom being present at time of diagnosis.

Please follow the recommendations below when choosing your diagnostic path.

1. First make sure the DRBIII® is communicating with the appropriate modules; ie., if the DRBIII® displays a "No Response" condition, you must diagnose this first before proceeding.
2. Read DTC's (diagnostic trouble codes) with the DRBIII®.
3. If no DTC's are present, identify the customer complaint.
4. Once the DTC or customer complaint is identified, locate the matching test in the Table of Contents and begin to diagnose the symptom.

All component location views are in Section 8.0. All connector pinouts are in Section 9.0. All system schematics are in Section 10.0.

An * placed before the symptom description indicates a customer complaint.

When repairs are required, refer to the appropriate service manual for the proper removal and repair procedure.

Diagnostic procedures change every year. New diagnostic systems may be added; carryover systems may be enhanced. **READ THIS MANUAL BEFORE TRYING TO DIAGNOSE A VEHICLE CODE.** It is recommended that you review the entire manual to become familiar with all new and changed diagnostic procedures.

After using this book, if you have any comments or recommendations, please fill out the form at the back of the book and mail it back to us.

1.1 SYSTEM COVERAGE

This diagnostic procedures manual covers the 1999 XJ Jeep Cherokee with 2.5L and 4.0L engines.

1.2 SIX-STEP TROUBLESHOOTING PROCEDURE

Diagnosis of the powertrain control module (PCM) is done in six basic steps:

- verification of complaint
- verification of any related symptoms
- symptom analysis
- problem isolation
- repair of isolated problem
- verification of proper operation

2.0 IDENTIFICATION OF SYSTEM

The Powertrain Control Module (PCM) monitors and controls:

- Fuel system
- Ignition system
- charging system
- speed control system
- cooling system

3.0 SYSTEM DESCRIPTION AND FUNCTIONAL OPERATION

3.1 GENERAL DESCRIPTION

These Sequential Fuel Injection (SFI) engine systems have the latest in technical advances. The on-board OBDII diagnostics incorporated with the powertrain control module (PCM) are intended to assist the field technician in repairing vehicle problems by the quickest means.

3.2 FUNCTION OPERATION

3.2.1 FUEL CONTROL

The PCM controls the air/fuel ratio of the engine by varying fuel injector on time. Mass air flow is calculated using the speed density method using engine speed, manifold absolute pressure, and air temperature change.

Different fuel calculation strategies are used dependent on the operational state of the engine. During crank mode, a prime shot fuel pulse is delivered followed by fuel pulses determined by a crank time strategy. Cold engine operation is determined via an open loop strategy until the O2 sensors have reached operating temperature. At this point, the strategy enters a closed loop mode where fuel requirements are based upon the state of the O2 sensors, engine speed, MAP, throttle position, air temperature, battery voltage, and coolant temperature.

3.2.2 ON-BOARD DIAGNOSTICS

The PCM has been programmed to monitor many different circuits of the fuel injection system. This monitoring is called "on-board diagnosis."

Certain criteria, or "arming conditions," must be met for a trouble code to be entered into the PCM memory. The criteria may be a range of: engine rpm, engine temperature, and/or input voltage to the PCM. If a problem is sensed with a monitored

GENERAL INFORMATION

circuit, and all of the criteria or arming conditions are met, then a trouble code will be stored in the PCM.

It is possible that a trouble code for a monitored circuit may not be entered into the PCM memory even though a malfunction has occurred. This may happen because one of the trouble code criteria (arming conditions) have not been met.

The PCM compares input signal voltages from each input device with specifications (the established high and low limits of the range) that are programmed into it for that device. If the input voltage is not within specifications and other trouble code criteria (arming conditions) are met, a trouble code will be stored in the PCM memory.

The On Board Diagnostics have evolved to the second Generation of Diagnostics referred to as OBDII. These OBDII Diagnostics control the functions necessary to meet the requirements of California OBDII and Federal OBD regulation. These requirements specify the inclusion of a Malfunction Indicator Light (MIL) located on the instrument panel for all 1994 and subsequent model-year passenger cars, light duty trucks, and medium-duty vehicles. The purpose of the MIL is to inform the vehicle operator in the event of a malfunction of any emission system or component.

The following table summarizes the various OBDII monitors operation.

OBD II MONITOR INFORMATION

Comprehensive Components Monitor	Major Monitors Non Fuel Control & Non Misfire	Major Monitors Fuel Control & Misfire
Run constantly	Run Once Per Trip	Run Constantly
Includes All Engine Hardware - Sensors, Switches, Solenoids, etc.	Monitors Entire Emission System	Monitors Entire System
One Trip Faults - Turns On The MIL and Sets DTC After One Failure	Two Trip Faults - Turns On The MIL and Sets DTC After Two Consecutive Failures	Two Trip Faults - Turns On The MIL and Sets DTC After Two Consecutive Failures
Priority 3	Priority 1 or 3	Priority 2 or 4
All Checked For Continuity	Done Stop Testing = Yes	Fuel Control Monitor Monitors Fuel Control System For: Fuel System Lean Fuel System Rich Requires 3 Consecutive <i>Fuel System Good Trips</i> To Extinguish The MIL
Open Short To Ground Short To Voltage	Oxygen Sensor Heater Oxygen Sensor Response	
Inputs Checked For Rationality	Catalytic Converter Efficiency Except EWMA - up to 6 tests per trip and a one trip fault	Misfire Monitor Monitors For Engine Misfire at: 1000 RPM Counter (Type B) **200 RPM Counter (Type A) Requires 3 Consecutive <i>Misfire Good Trips</i> To Extinguish the MIL **Type A misfire is a one trip failure. The MIL will illuminate and blink at the first failure.
Outputs Checked For Functionality		
	EGR System	
	Evaporative Emission System (Purge and Leak) Non-LDP or LDP	
Requires 3 Consecutive <i>Global/Alternate Good Trips</i> to Extinguish the MIL*	Requires 3 Consecutive <i>Global Good Trips</i> to Extinguish the MIL*	
*40 Warm Up Cycles are required to erase DTC's after the MIL has been extinguished.		

GENERAL INFORMATION

3.2.3 TRANSMISSION CONTROL

The automatic transmission for this vehicle is an AW4 model controlled by a separate controller. Further explanation of the transmission control and operation can be found in the AW4 transmission diagnostic manual.

3.2.4 OTHER CONTROLS

CHARGING SYSTEM

The charging system is turned on when the engine is started and ASD relay energized. When the ASD relay is on, ASD output voltage is supplied to the ASD sense circuit at the PCM. This voltage is connected in some cases, through the PCM and supplied to one of the generator field terminals (Gen Source +). All others, the Gen field is connected directly to the ASD output voltage. The amount of current produced by the generator is controlled by the Electronic Voltage Regulator (EVR) circuitry, in the PCM. A battery temperature sensor, located either in the battery tray, using the ambient sensor, or in the PCM itself, is used to sense battery temperature. This temperature along with sensed line voltage, is used by the PCM to vary the battery charging rate. This is done by cycling the ground path to the other generator field terminal (Gen field driver).

SPEED CONTROL SYSTEM

The PCM controls vehicle speed by operation of the speed control servo vacuum and vent solenoids. Energizing the vacuum solenoid applies vacuum to the servo to increase throttle position. Operation of the vent solenoid slowly releases the vacuum allowing throttle position to decrease. A special dump solenoid allows immediate release of throttle position caused by braking, cruise control switch turned off, shifting into neutral, excessive RPM (tires spinning) or ignition key off.

LEAK DETECTION PUMP SYSTEM

The leak detection pump is a device that pressurizes the evaporative system to determine if there are any leaks. When certain conditions are met, the PCM will activate the pump and start counting pump strokes. If the pump stops within a calibrated number of strokes, the system is determined to be normal. If the pump does not stop or stops too soon, a DTC will be set.

3.2.5 PCM OPERATING MODES

As input signals to the powertrain control module (PCM) change, the PCM adjusts its response to output devices. For example, the PCM must calculate a different injector pulse width and ignition timing for idle than it does for wide open throttle.

There are several different modes of operation that determine how the PCM responds to the various input signals.

There are two types of engine control operation: **open loop** and **closed loop**.

In open loop operation, the PCM receives input signals and responds according to preset programming. Inputs from the heated oxygen sensors are not monitored.

In closed loop operation, the PCM monitors the inputs from the heated oxygen sensors. This input indicates to the PCM whether or not the calculated injector pulse width results in the ideal air-fuel ratio of 14.7 parts air to 1 part fuel. By monitoring the exhaust oxygen content through the oxygen sensor, the PCM can fine tune injector pulse width. Fine tuning injector pulse width allows the PCM to achieve the lowest emission levels while maintaining optimum fuel economy.

The engine start-up (crank), engine warm-up, and wide open throttle modes are open loop modes. Under most operating conditions, closed loop modes occur with the engine at operating temperature.

IGNITION SWITCH ON (ENGINE OFF) MODE

When the ignition switch activates the fuel injection system, the following actions occur:

1. The PCM determines atmospheric air pressure from the MAP sensor input to determine basic fuel strategy.
2. The PCM monitors the engine coolant temperature sensor and throttle position sensor input. The PCM modifies fuel strategy based on this input.

When the key is in the "on" position and the engine is not running (zero rpm), the auto shut-down relay and fuel pump relay are not energized. Therefore, voltage is not supplied to the fuel pump, ignition coil, and fuel injectors.

Engine Start-up Mode — This is an open loop mode. The following actions occur when the starter motor is engaged:

1. The auto shutdown and fuel pump relays are energized. If the PCM does not receive the camshaft and crankshaft signal within approximately one second, these relays are de-energized.
2. The PCM energizes all fuel injectors until it determines crankshaft position from the camshaft and crankshaft signals. The PCM determines crankshaft position within one engine revolution. After the crankshaft position has been determined, the PCM energizes the fuel injectors in sequence. The PCM adjusts the injector pulse width and synchronizes the fuel injectors by controlling the fuel injectors' ground paths.

Once the auto shutdown and fuel pump relays have been energized, the PCM determines the fuel injector pulse width based on the following:

- engine coolant temperature
- manifold absolute pressure
- intake air temperature
- engine revolutions
- throttle position

The PCM determines the spark advance based on the following:

- engine coolant temperature
- crankshaft position
- camshaft position
- intake air temperature
- manifold absolute pressure
- throttle position

Engine Warm-Up Mode – This is an open loop mode. The PCM adjusts injector pulse width and controls injector synchronization by controlling the fuel injectors' ground paths. The PCM adjusts ignition timing and engine idle speed. The PCM adjusts the idle speed by controlling the idle air control motor.

Cruise or Idle Mode – When the engine is at normal operating temperature, this is a closed loop mode. During certain idle conditions, the PCM may enter into a variable idle speed strategy. At this time, the PCM adjusts engine speed based on the following inputs:

- throttle position
- battery voltage
- engine coolant temperature

Acceleration Mode – This is a closed loop mode. The PCM recognizes an increase in throttle position and a decrease in Manifold Vacuum as engine load increases. In response, the PCM increases the injector pulse width to meet the increased load.

Deceleration Mode – This is a closed loop mode. The PCM recognizes a decrease in throttle position and an increase in Manifold Vacuum as engine load decreases. In response, the PCM decreases the injector pulse width to meet the decreased load.

Wide Open Throttle Mode – This is an open loop mode. The throttle position sensor notifies the PCM of a wide open throttle condition. The PCM adjusts injector pulse width to supply a predetermined amount of additional fuel.

3.2.6 NON-MONITORED CIRCUITS

The PCM does not monitor the following circuits, systems, and conditions even though they could have malfunctions that result in driveability problems. A diagnostic code may not be displayed for the following conditions. However, problems with these

systems may cause a diagnostic code to be displayed for other systems. For example, a fuel pressure problem will not register a diagnostic code directly, but could cause a rich or lean condition. This could cause an oxygen sensor, fuel system, or misfire monitor trouble code to be stored in the PCM.

Engine Timing – The PCM cannot detect an incorrectly indexed timing chain, camshaft sprocket, or crankshaft sprocket. The PCM also cannot detect an incorrectly indexed distributor.(*)

Fuel Pressure – Fuel pressure is controlled by the fuel pressure regulator. The PCM cannot detect a clogged fuel pump inlet filter, clogged in-line filter, or a pinched fuel supply.(*)

Fuel Injectors – The PCM cannot detect if a fuel injector is clogged, the pintle is sticking, or the wrong injectors are installed.(*)

Fuel Requirements – Poor quality gasoline can cause problems such as hard starting, stalling, and stumble. Use of methanol-gasoline blends may result in starting and driveability problems. (See individual symptoms and their definitions in Section 6.0 (Glossary of Terms).

PCM Grounds – The PCM cannot detect a poor system ground. However, a diagnostic trouble code may be stored in the PCM as a result of this condition.

Throttle Body Air Flow – The PCM cannot detect a clogged or restricted air cleaner inlet or filter element.(*)

Exhaust System – The PCM cannot detect a plugged, restricted, or leaking exhaust system.(*)

Cylinder Compression – The PCM cannot detect uneven, low, or high engine cylinder compression.(*)

Excessive Oil Consumption – Although the PCM monitors the exhaust stream oxygen content through the oxygen sensor when the system is in a closed loop, it cannot determine excessive oil consumption.

(*)NOTE: Any of these conditions could result in a rich or lean condition causing an oxygen sensor trouble code to be stored in the PCM, or the vehicle may exhibit one or more of the driveability symptoms listed in the Table of Contents.

3.3 DIAGNOSTIC TROUBLE CODES

Each diagnostic trouble code is diagnosed by following a specific testing procedure. The diagnostic test procedures contain step-by-step instructions for determining the cause of trouble codes as well as no trouble code problems. It is not necessary to perform all of the tests in this book to diagnose an individual code.

Always begin by reading the diagnostic trouble codes using the DRBIII®.

GENERAL INFORMATION

3.3.1 HARD CODE

A diagnostic trouble code that comes back within one cycle of the ignition key is a "hard" code. This means that the defect is there every time the powertrain control module checks that circuit or function. Procedures in this manual verify if the trouble code is a hard code at the beginning of each test. When it is not a hard code, an "intermittent" test must be performed.

Codes that are for OBDII monitors will not set with just the ignition key on. Comparing these to non-emission codes, they will seem like an intermittent. These codes require a set of parameters to be performed (The DRBIII® pre-test screens will help with this for MONITOR codes), this is called a "TRIP". All OBDII DTCs will be set after one or in some cases two trip failures, and the MIL will be turned on. These codes require three successful, no failures, TRIPS to extinguish the MIL, followed by 40 warm-up cycles to erase the code. For further explanation of TRIPS, Pre-test screens, Warm-up cycles, and the use of the DRBIII®, refer to the On Board Diagnostic training booklet #81-699-97094.

3.3.2 INTERMITTENT CODE

A diagnostic trouble code that is not there every time the PCM checks the circuit is an "intermittent" code. Most intermittent codes are caused by wiring or connector problems. Defects that come and go like this are the most difficult to diagnose; they must be looked for under specific conditions that cause them. The following checks may assist you in identifying a possible intermittent problem:

- Visually inspect related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.

SYMPTOM

HARD START

DIAGNOSTIC TEST

CHECKING SECONDARY IGNITION SYSTEM
CHECKING ENGINE VACUUM
CHECKING THE FUEL PRESSURE
CHECKING COOLANT SENSOR CALIBRATION
CHECKING THROTTLE POSITION SENSOR CALIBRATION
CHECKING MAP SENSOR CALIBRATION
CHECKING THE MINIMUM IDLE AIR FLOW
CHECKING IDLE AIR CONTROL MOTOR OPERATION
CHECKING ENGINE MECHANICAL SYSTEMS
CHECKING EVAP EMISSION SYSTEM
CHECKING EGR SYSTEM
CHECKING IAT SENSOR

- Visually inspect the related harnesses. Look for chafed, pierced, or partially broken wire.
- Refer to any Hotline Newsletters or technical service bulletins that may apply.
- Use the DRBIII® data recorder or co-pilot.

3.3.3 RESET COUNTER

The reset counter counts the number of times the vehicle has been started since codes were last set, erased, or the battery was disconnected. The reset counter will count up to 255 start counts.

The number of starts helps determine when the trouble code actually happened. This is recorded by the PCM and can be viewed on the DRB as STARTS since set.

When there are no trouble codes stored in memory, the DRB will display "NO TROUBLE CODES FOUND" and the reset counter will show "STARTS since clear = XXX."

3.3.4 HANDLING NO TROUBLE CODE PROBLEMS

Symptom checks cannot be used properly unless the driveability problem characteristic actually happens while the vehicle is being tested.

Select the symptom that most accurately describes the vehicle's driveability problem and then perform the test routine that pertains to this symptom. Perform each routine test in sequence until the problem is found. For definitions, see Section 6.0 Glossary Of Terms.

GENERAL INFORMATION

SYMPTOM	DIAGNOSTIC TEST
START AND STALL	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING IDLE AIR CONTROL MOTOR OPERATION
HESITATION/SAG/STUMBLE	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING ENGINE VACUUM CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING O2S HEATER CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING ENGINE MECHANICAL SYSTEMS CHECKING EVAP EMISSION SYSTEM CHECKING EGR SYSTEM CHECKING IAT SENSOR CHECKING PNP SWITCH
SURGE	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING EVAP EMISSION SYSTEM
LACK OF POWER/SLUGGISH	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING EGR SYSTEM

GENERAL INFORMATION

SYMPTOM	DIAGNOSTIC TEST
SPARK KNOCK/DETONATION	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING EVAP EMISSION SYSTEM
CUTS OUT/MISSES	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING EGR SYSTEM
BACKFIRE/POPBACK	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING THE FUEL PRESSURE CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING EGR SYSTEM
RUNS ROUGH/UNSTABLE/ ERRATIC IDLE	CHECKING SECONDARY IGNITION SYSTEM CHECKING PCM POWER AND GND CKT CHECKING ENGINE VACUUM CHECKING THE FUEL PRESSURE CHECKING COOLANT SENSOR CALIBRATION CHECKING THROTTLE POSITION SENSOR CALIBRATION CHECKING MAP SENSOR CALIBRATION CHECKING THE MINIMUM IDLE AIR FLOW CHECKING FOR OXYGEN SENSOR SWITCHING CHECKING O2S HEATER CHECKING IDLE AIR CONTROL MOTOR OPERATION CHECKING ENGINE MECHANICAL SYSTEMS CHECKING EVAP EMISSION SYSTEM CHECKING EGR SYSTEM CHECKING IAT SENSOR CHECKING PNP SWITCH

SYMPTOM

POOR FUEL ECONOMY

DIAGNOSTIC TEST

CHECKING SECONDARY IGNITION SYSTEM
CHECKING PCM POWER AND GND CKT
CHECKING ENGINE VACUUM
CHECKING THE FUEL PRESSURE
CHECKING COOLANT SENSOR CALIBRATION
CHECKING THROTTLE POSITION SENSOR CALIBRATION
CHECKING MAP SENSOR CALIBRATION
CHECKING THE MINIMUM IDLE AIR FLOW
CHECKING FOR OXYGEN SENSOR SWITCHING
CHECKING O2S HEATER
CHECKING IDLE AIR CONTROL MOTOR OPERATION
CHECKING ENGINE MECHANICAL SYSTEMS
CHECKING EVAP EMISSION SYSTEM
CHECKING EGR SYSTEM
CHECKING IAT SENSOR
CHECKING PNP SWITCH

3.3.5 NO START INFORMATION

IMPORTANT NOTE:

If the Powertrain Control Module has been changed and the correct VIN and mileage have not been programmed, a DTC will be set in the ABS and Air bag modules. In addition, if the vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable starting.

FOR ABS AND AIR BAG SYSTEMS:

1. Enter correct VIN and Mileage in PCM.
2. Erase codes in ABS and Air Bag modules.

FOR SKIM THEFT ALARM:

1. Connect the DRBIII® to the data link connector.
2. Go to Theft Alarm, SKIM, Misc. and place the SKIM in *secured access* mode, by using the appropriate PIN code for this vehicle.
3. Select Update the Secret Key data, data will be transferred from the SKIM to the PCM (This is required to allow the vehicle to start with the new PCM).
4. If three attempts are made to enter *secured access* mode using the incorrect PIN, *secured access* mode will be locked out for one hour. To exit this lock out mode, leave the ignition key in the Run/Start position for one hour. Ensure all accessories are turned off. Also monitor the battery state and connect a battery charger if necessary.

3.4 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading trouble codes, erasing trouble codes, and other DRBIII® functions.

3.5 DRBIII® ERROR MESSAGES AND BLANK SCREEN

Under normal operation, the DRBIII® will display one of only two error messages:

- User-Requested WARM Boot or User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the MDS Hotline, or call for information and assistance at 1-800-825-8737. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err: 0x1
User-Requested COLD Boot
```

Press MORE to switch between this display and the application screen.
Press F4 when done noting information.

3.5.1 DRBIII® DOES NOT POWER UP

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage (data link connector cavity 16). A minimum of 11 volts is required to adequately power the DRBIII®.

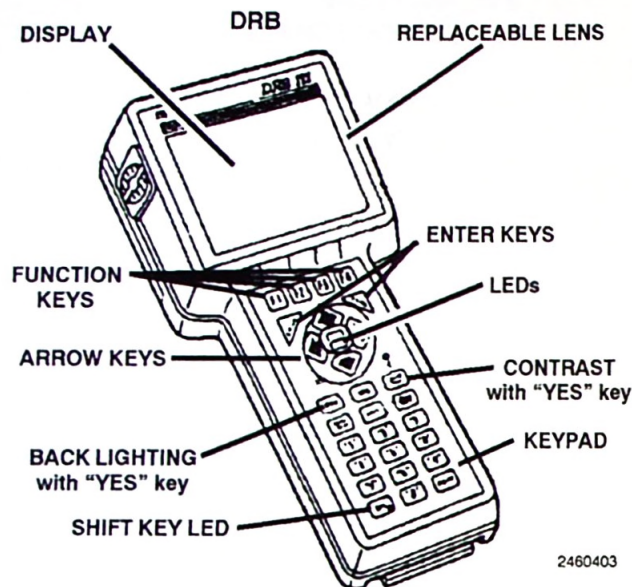
If all connections are proper between the DRBIII® and the vehicle or other devices, and the

GENERAL INFORMATION

vehicle battery is fully charged, and inoperative DRBIII® may be the result of faulty cable or vehicle wiring. For a blank screen, refer to the appropriate body diagnostics manual.

3.5.2 DISPLAY IS NOT VISIBLE

Low temperatures will affect the visibility of the display. Adjust the contrast to compensate for this condition



4.0 DISCLAIMERS, SAFETY, WARNINGS

4.1 DISCLAIMERS

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

4.2 SAFETY

4.2.1 TECHNICIAN SAFETY INFORMATION

WARNING: ENGINES PRODUCE CARBON MONOXIDE THAT IS ODORLESS, CAUSES SLOWER REACTION TIME, AND CAN LEAD TO SERIOUS INJURY. WHEN THE ENGINE IS OPERATING, KEEP SERVICE AREAS WELL VENTILATED OR ATTACH THE VEHICLE EXHAUST SYSTEM TO THE SHOP EXHAUST REMOVAL SYSTEM.

Set the parking brake and block the wheels before testing or repairing the vehicle. It is especially important to block the wheels on front-wheel drive vehicles; the parking brake does not hold the drive wheels.

When servicing a vehicle, always wear eye protection, and remove any metal jewelry such as watchbands or bracelets that might make an inadvertent electrical contact.

When diagnosing a powertrain system problem, it is important to follow approved procedures where applicable. These procedures can be found in service manual procedures. Following these procedures is very important to the safety of individuals performing diagnostic tests.

4.2.2 VEHICLE PREPARATION FOR TESTING

Make sure the vehicle being tested has a fully charged battery. If it does not, false diagnostic codes or error messages may occur.

4.2.3 SERVICING SUB-ASSEMBLIES

Some components of the powertrain system are intended to be serviced in assembly only. Attempting to remove or repair certain system sub-components may result in personal injury and/or improper system operation. Only those components with approved repair and installation procedures in the service manual should be serviced.

4.2.4 DRBIII® SAFETY INFORMATION

WARNING: EXCEEDING THE LIMITS OF THE DRB MULTIMETER IS DANGEROUS. IT CAN EXPOSE YOU TO SERIOUS INJURY. CAREFULLY READ AND UNDERSTAND THE CAUTIONS AND THE SPECIFICATION LIMITS.

Follow the vehicle manufacturer's service specifications at all times.

- Do not use the DRB if it has been damaged.
- Do not use the test leads if the insulation is damaged or if metal is exposed.
- To avoid electrical shock, do not touch the test leads, tips, or the circuit being tested.
- Choose the proper range and function for the measurement. Do not try voltage or current measurements that may exceed the rated capacity.
- Do not exceed the limits shown in the table below:

FUNCTION	INPUT LIMIT
Volts	0 - 500 peak volts AC 0 - 500 volts DC
Ohms (resistance)*	0 - 1.12 megohms
Frequency Measured Frequency Generated	0 - 10 kHz

FUNCTION	INPUT LIMIT
Temperature	-58 - 1100°F -50 - 600°C

* Ohms cannot be measured if voltage is present. Ohms can be measured only in a non-powered circuit.

- Voltage between any terminal and ground must not exceed 500v DC or 500v peak AC.
- Use caution when measuring voltage above 25v DC or 25v AC.
- The circuit being tested must be protected by a 10A fuse or circuit breaker.
- Use the low current shunt to measure circuits up to 10A. Use the high current clamp to measure circuits exceeding 10A.
- When testing for the presence of voltage or current, make sure the meter is functioning correctly. Take a reading of a known voltage or current before accepting a zero reading.
- When measuring current, connect the meter in series with the load.
- Disconnect the live test lead before disconnecting the common test lead.
- When using the meter function, keep the DRB away from spark plug or coil wires to avoid measuring error from outside interference.

4.3 WARNINGS AND CAUTIONS

4.3.1 ROAD TEST WARNINGS

Some complaints will require a test drive as part of the repair verification procedure. The purpose of the test drive is to try to duplicate the diagnostic code or symptom condition.

CAUTION: BEFORE ROAD TESTING A VEHICLE, BE SURE THAT ALL COMPONENTS ARE REASSEMBLED. DURING THE TEST DRIVE, DO NOT TRY TO READ THE DRBIII® SCREEN WHILE IN MOTION. DO NOT HANG THE DRBIII® FROM THE REAR VIEW MIRROR OR OPERATE IT YOURSELF. HAVE AN ASSISTANT AVAILABLE TO OPERATE THE DRBIII®.

4.3.2 VEHICLE DAMAGE CAUTIONS

Before disconnecting any control module, make sure the ignition is "off". Failure to do so could damage the module.

When testing voltage or continuity at any control module, use the terminal side (not the wire end) of the connector. Do not probe a wire through the

insulation; this will damage it and eventually cause it to fail because of corrosion.

Be careful when performing electrical tests so as to prevent accidental shorting of terminals. Such mistakes can damage fuses or components. Also, a second code could be set, making diagnosis of the original problem more difficult.

5.0 REQUIRED TOOLS AND EQUIPMENT

DRBIII® (diagnostic read-out box) scan tool
Evaporative System Diagnostic Kit #6917
fuel filler adapter #6922

fuel pressure adapter (C-6631) or #6539

fuel pressure kit (C-4799-B) or #5069

fuel release hose (C-4799-1)

Min Air flow fitting #6714

jumper wires

ohmmeter

oscilloscope

vacuum gauge

voltmeter

12 volt test light minimum 25 ohms resistance with probe #6801

CAUTION: A 12 VOLT TEST LIGHT SHOULD NOT BE USED FOR THE FOLLOWING CIRCUITS, DAMAGE TO THE POWERTRAIN CONTROLLER WILL OCCUR.

- 5 Volt Supply
- 8 Volt Supply
- J1850 PCI Bus
- CCD Bus
- CKP Sensor Signal
- CMP Sensor Signal
- Vehicle Speed Sensor Signal
- O2 Sensor Signal

6.0 GLOSSARY OF TERMS

ABS anti-lock brake system

backfire, popback fuel ignites in either the intake or the exhaust system

CKP crank position sensor

CMP camshaft position sensor

cuts out, misses a steady pulsation or the inability of the engine to maintain a consistent rpm

DLC data link connector (previously called "engine diagnostic connector")

GENERAL INFORMATION

detonation, spark knock	a mild to severe ping, especially under loaded engine conditions	MIL	malfunction indicator lamp
ECT	engine coolant temperature sensor	MTV	manifold tuning valve
EGR	exhaust gas recirculation valve and system	O2S	oxygen sensor
EMCC	electronic modulated convertor clutch	PCI	programmable communication interface
generator	previously called "alternator"	PCM	powertrain control module
hard start	The engine takes longer than usual to start, even though it is able to crank normally.	PCV	positive crankcase ventilation
hesitation, sag, stumble	There is a momentary lack of response when the throttle is opened. This can occur at all vehicle speeds. If it is severe enough, the engine may stall.	PEP	peripheral expansion port
IAT	intake air temperature sensor	poor fuel economy	There is significantly less fuel mileage than other vehicles of the same design and configuration
IAC	idle air control valve	rough, unstable, or erratic idle stalling	The engine runs unevenly at idle and causes the engine to shake if it is severe enough. The engine idle rpm may vary (called "hunting"). This condition may cause stalling if it is severe enough.
JTEC	Combined engine and transmission control module	start & stall	The engine starts but immediately dies.
lack of power, sluggish	The engine has less than expected power, with little or no increase in vehicle speed when the throttle is opened.	surge	engine rpm fluctuation without corresponding change in throttle position sensor
LDP	leak detection pump	TPS	throttle position sensor
MAP	manifold absolute pressure sensor	TRS	transmission range sensor
		VSS	vehicle speed sensor/signal

7.0

DIAGNOSTIC INFORMATION AND PROCEDURES

CHARGING

Symptom:

P-0622 GENERATOR FIELD NOT SWITCHING PROPERLY

When Monitored and Set Condition:

P-0622 GENERATOR FIELD NOT SWITCHING PROPERLY

When Monitored: With the ignition key on and the engine running.

Set Condition: When the PCM tries to regulate the generator field with no result during monitoring.

POSSIBLE CAUSES
GENERATOR FIELD RESISTANCE ≥ 5.0 OHMS
GENERATOR FIELD DRIVER CIRCUIT OPEN
GENERATOR FIELD DRIVER CIRCUIT SHORTED TO GROUND
GENERATOR FIELD WIRING HARNESS INTERMITTENT DEFECT
GENERATOR FIELD WIRING HARNESS OBSERVABLE DEFECT
POWERTRAIN CONTROL MODULE DEFECTIVE
GENERATOR FIELD SOURCE (+) CIRCUIT OPEN

P-0622 GENERATOR FIELD NOT SWITCHING PROPERLY — Continued

TEST	ACTION	APPLICABILITY
1	<p>Ignition On, Engine Not Running</p> <p>With the DRB, record all DTC's and freeze frame data, now erase Codes.</p> <p>Carefully inspect all Connectors for corrosion or spread Terminals before continuing.</p> <p>Note: The 2 Field Terminals (+ and -) are located on the back of the generator.</p> <p>Note: To locate and identify the (-) terminal and circuit, refer to service manual, group 8w, wiring diagrams.</p> <p>Note: Another way to identify the (-) terminal is to start the engine and measure voltage at both field terminals.</p> <p>Note: The (+) terminal will show battery voltage (12.5 to 14.5 volts). The (-) terminal will show 3 - 8 volts less than battery voltage.</p> <p>With the DRB actuate the Generator Field Driver Circuit.</p> <p>Using a voltmeter, backprobe the Generator Field Source (+) Ckt at back of Generator.</p> <p>Is the voltage above 10.0 volts?</p> <p>Yes → Go To 2</p> <p>No → Repair the open Generator Field Source (+) Circuit from Generator to PCM Connector.</p>	All
2	<p>Ignition On, Engine Not Running</p> <p>With the DRB, record all DTC's and freeze frame data, now erase Codes.</p> <p>Carefully inspect all Connectors for corrosion or spread Terminals before continuing.</p> <p>Note: The 2 Field Terminals (+ and -) are located on the back of the generator.</p> <p>Note: To locate and identify the (-) terminal and circuit, refer to service manual, group 8w, wiring diagrams.</p> <p>Note: Another way to identify the (-) terminal is to start the engine and measure voltage at both field terminals.</p> <p>Note: The (+) terminal will show battery voltage (12.5 to 14.5 volts). The (-) terminal will show 3 - 8 volts less than battery voltage.</p> <p>With the DRB actuate the Generator Field Driver Circuit.</p> <p>Using a voltmeter, backprobe the Gen Field Driver Circuit at the back of the Generator.</p> <p>Does the voltage shift from low to high?</p> <p>Yes → Go To 3</p> <p>No → Go To 5</p>	All
3	<p>Ignition On, Engine Not Running</p> <p>With the DRB actuate the Generator Field Driver Circuit.</p> <p>With the DRB, read Codes.</p> <p>Wiggle Wiring Harness from the Generator to PCM.</p> <p>Does the Generator Field Driver (-) Circuit code return?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 4</p>	All
4	<p>Ignition Off</p> <p>Using the schematic as a guide, inspect the Wiring and Connectors.</p> <p>Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-3A.</p> <p>No → Test Complete.</p>	All

CHARGING

P-0622 GENERATOR FIELD NOT SWITCHING PROPERLY — Continued

TEST	ACTION	APPLICABILITY
5	<p>Ignition Off</p> <p>Disconnect the Gen Field Harness Connector at back of the Generator.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following steps.</p> <p>Measure resistance across the Generator Field Terminals at the Generator.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 6</p> <p>No → Repair the Generator as necessary.</p> <p>Perform Powertrain Verification Test VER-3A.</p>	All
6	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Gen Field Harness Connector at back of the Generator.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use a Ohmmeter in the following steps.</p> <p>Measure the Gen Field Driver Circuit at Generator Harness Conn to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Generator Field Driver Circuit short to ground.</p> <p>Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 7</p>	All
7	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Gen Field Harness Connector at back of the Generator.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following steps.</p> <p>Measure the resistance of the Gen Field Driver Ckt, Gen Conn to the PCM Conn.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 8</p> <p>No → Repair open Generator Field Driver Circuit, Generator to PCM.</p> <p>Perform Powertrain Verification Test VER-3A.</p>	All
8	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-3A.</p>	All

Symptom:**P-1594 CHARGING SYSTEM VOLTAGE TOO HIGH****When Monitored and Set Condition:****P-1594 CHARGING SYSTEM VOLTAGE TOO HIGH**

When Monitored: With the ignition key on and the engine speed greater than 0 RPM

Set Condition: When the PCM regulates the generator field and there are no detected field problems but the voltage output does not decrease.

POSSIBLE CAUSES

GENERATOR FIELD DRIVER CIRCUIT SHORT TO GROUND

GENERATOR SHORTED

BATTERY TEMPERATURE SENSOR DEFECTIVE

POWERTRAIN CONTROL MODULE DEFECTIVE (GENERATOR RESISTANCE)

PCM DEFECTIVE (BATTERY TEMPERATURE)

POWERTRAIN CONTROL MODULE DEFECTIVE (BATTERY VOLTAGE)

CHARGING

P-1594 CHARGING SYSTEM VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
9	<p>Note: The 2 Field Terminals (+ and -) are located on the back of the generator.</p> <p>Note: To locate and identify the (-) terminal and circuit, refer to service manual, group 8w, wiring diagrams.</p> <p>Note: Another way to identify the (-) terminal is to start the engine and measure voltage at both field terminals.</p> <p>Note: The (+) terminal will show battery voltage (12.5 to 14.5 volts). The (-) terminal will show 3 - 8 volts less than battery voltage.</p> <p>Ignition On, Engine Not Running With DRB, actuate the Generator Field Driver. With a Voltmeter, backprobe the Generator Field Driver Circuit in back of Generator. Does the voltage shift low to high?</p> <p>Yes → Go To 10 No → Go To 14</p>	All
10	<p>Ignition On, Engine Not Running With the DRB, actuate the Generator Field Driver. With DRB, stop the Generator Field Driver actuation. With DRB, read the Target Charging voltage. Is the Target Charging voltage above 0 volts?</p> <p>Yes → Go To 11 No → Go To 12</p>	All
11	<p>Start the engine. Manually set the engine speed to 1600 RPM. With DRB, read both the Battery voltage and the Target Charging voltage. Compare the "Target Voltage" to the "Battery Voltage" reading. Monitor voltage for 5 minutes, if necessary. Look for a 1.0 volt difference or more. Was there more than a 1.0 volt difference?</p> <p>Yes → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-3A.</p> <p>No → Test Complete.</p>	All
12	<p>Ignition On, Engine Not Running With the DRB read the Battery Temp Sensor temperature. Using a thermometer measure under hood temperature near Battery tray. Is the temperature within 10 deg of Battery temperature?</p> <p>Yes → Go To 13 No → Replace Battery Temp Sensor. Perform Powertrain Verification Test VER-3A.</p>	All
13	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace Powertrain Control Module. Perform Powertrain Verification Test VER-3A.</p>	All

P-1594 CHARGING SYSTEM VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
14	<p>Ignition Off</p> <p>Disconnect the Field Harness Connector at back of the Generator.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Measure resistance of the Generator Field Terminals at the Generator to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair or replace the shorted Generator as necessary. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 15</p>	All
15	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Field Harness Connector at back of the Generator.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With an Ohmmeter, measure the Generator Field Driver Circuit from the PCM Connector to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Generator Field Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 16</p>	All
16	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-3A.</p>	All

CHARGING

Symptom:

P-1682 CHARGING SYSTEM VOLTAGE TOO LOW

When Monitored and Set Condition:

P-1682 CHARGING SYSTEM VOLTAGE TOO LOW

When Monitored: With the ignition key on and the engine running over 1500 RPM after 25 seconds.

Set Condition: When the PCM regulates the generator field and there are no detected field problems but the voltage output does not increase.

POSSIBLE CAUSES

GENERATOR FIELD TERMINALS VOLTAGE BELOW 3.0 VOLTS

B (+) CIRCUIT HIGH RESISTANCE

GENERATOR GROUND HIGH RESISTANCE

GENERATOR FIELD DRIVER CIRCUIT OPEN

GENERATOR FIELD DRIVER CIRCUIT SHORTED TO GROUND

GENERATOR FIELD SOURCE CIRCUIT OPEN

GENERATOR FIELD SOURCE CIRCUIT SHORTED TO GROUND

BTS DEF

PCM DEFECTIVE

POWERTRAIN CONTROL MODULE DEFECTIVE (TEMP NOT W/I 10 DEG)

P-1682 CHARGING SYSTEM VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
17	Ignition Off Note: Battery must be fully charged. Note: Generator Belt tension and condition must be checked before continuing. Start Engine With the DRB, read the Target Charging voltage. Is the target charging voltage above 15.1 volts? Yes → Go To 18 No → Go To 21	All
18	Ignition Off Note: Battery must be fully charged. Note: Generator Belt tension and condition must be checked before continuing. Start engine and allow it to reach operating temperature. With the DRB, read the BTS temperature. Using a Thermometer, measure under hood temperature. Is the temperature within 10 degrees F of Battery temperature? Yes → Go To 21 No → Go To 19	All
19	Ignition Off Disconnect the BTS Connector. Note: Check connectors - Clean/repair as necessary. Connect a jumper across the Terminals of the Battery Temperature Sensor. Ignition On, Engine Not Running With the DRB, read Battery Temperature Sensor voltage. Is the voltage reading equal to zero? Yes → Replace the Battery Temperature Sensor. Perform Powertrain Verification Test VER-3A. No → Go To 20	All
20	If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options. Repair Replace Powertrain Control Module. Perform Powertrain Verification Test VER-3A.	All
21	Start engine and let warm to operating temperature. Turn on all accessories, manually set engine speed to 1600 RPM. With the DRB, read Target Charging and Charging voltage. Compare the two readings. Is there more than a 1.0 volt difference? Yes → Go To 22 No → Go To 30	All

CHARGING

P-1682 CHARGING SYSTEM VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
22	<p>Ignition On, Engine Not Running Using a Voltmeter, measure voltage between the Generator B(+) Terminal and the Battery (+) Post. Start the engine and let warm to operating temperature. Is the voltage above 0.4 volt?</p> <p>Yes → Repair the B(+) Circuit for high resistance between the Generator and the Battery. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 23</p>	All
23	<p>Ignition On, Engine Not Running Using a Voltmeter, measure voltage between the Generator Case and Battery (-) Post. Caution: Ensure all wires are clear of the engine's moving parts. Start the engine and let warm to operating temperature. Is the voltage above 0.1 volt?</p> <p>Yes → Repair Generator Ground for high resistance, Generator Case to Battery (-) side. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 24</p>	All
24	<p>Ignition On, Engine Not Running With the DRB, actuate the Generator Field. Using a Voltmeter, measure both Generator Field Terminals. Is the voltage below 3.0 volts at either Terminal?</p> <p>Yes → Go To 25</p> <p>No → Charging system OK at this time. Perform Powertrain Verification Test VER-3A.</p>	All
25	<p>Ignition Off Disconnect the PCM Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Generator Field Driver Circuit from PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Generator Field Driver Circuit shorted to ground and replace PCM. Perform Powertrain Verification test VER-3A.</p> <p>No → Go To 26</p>	All
26	<p>Ignition Off Disconnect the PCM Connectors. Note: Check Connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Generator Field Driver Circuit from PCM to Generator. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 27</p> <p>No → Repair the open Generator Field Driver Circuit. Perform Powertrain Verification test VER-3A.</p>	All

P-1682 CHARGING SYSTEM VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
27	<p>Ignition Off Disconnect PCM Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Generator Field Source Circuit from PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Generator Field Source Circuit shorted to ground and replace PCM. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 28</p>	All
28	<p>Ignition Off Disconnect the PCM Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Generator Field Source Circuit from PCM to Generator. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 29</p> <p>No → Repair the open Generator Field Source Circuit. Perform Powertrain Verification Test VER-3A.</p>	All
29	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-3A.</p>	All
30	<p>Ignition On, Engine Not Running Using a Voltmeter, measure voltage between the Generator B(+) Terminal and the Battery (+) Post. Start the engine and let warm to operating temperature. Is the voltage above 0.4 volt?</p> <p>Yes → Repair the B(+) Circuit for high resistance between the Generator and the Battery. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 31</p>	All
31	<p>Ignition On, Engine Not Running Using a Voltmeter, measure voltage between the Generator Case and Battery (-) Post. Caution: Ensure all wires are clear of the engine's moving parts. Start the engine and let warm to operating temperature. Is the voltage above 0.1 volt?</p> <p>Yes → Repair Generator Ground for high resistance, Generator Case to Battery (-) side. Perform Powertrain Verification Test VER-3A.</p> <p>No → Test Complete.</p>	All

CHARGING

Symptom:

*** CHARGING SYSTEM NO CODE**

POSSIBLE CAUSES
TROUBLE CODES PRESENT (B)
TROUBLE CODES PRESENT (A)
GENERATOR FIELD TERMINAL INTERMITTENT DEFECT
GENERATOR GROUND CIRCUIT HIGH RESISTANCE
B(+) CIRCUIT HIGH RESISTANCE (0.4 VOLT)
B(+) CIRCUIT HIGH RESISTANCE (1.0 VOLT)
POWERTRAIN CONTROL MODULE DEFECTIVE (CHARGING SYSTEM NO CODE)
GENERATOR BELT OBSERVABLY DEFECTIVE

* CHARGING SYSTEM NO CODE — Continued

TEST	ACTION	APPLICABILITY
32	<p>Ignition Off</p> <p>Note: Battery condition must be verified prior to this test.</p> <p>Inspect the Generator Belt tension and condition.</p> <p>Is the Generator Belt OK?</p> <p>Yes → Go To 33</p> <p>No → Repair as necessary. Perform Powertrain Verification Test VER-3A.</p>	All
33	<p>Start engine</p> <p>Turn on all accessories and raise the engine speed to 2000 RPM for 30 seconds.</p> <p>Return the engine to idle speed and read Codes.</p> <p>Are there any Charging System Trouble Codes?</p> <p>Yes → Refer to Symptom list for problems related to charging.</p> <p>No → Go To 34</p>	All
34	<p>Ignition On, Engine Not Running</p> <p>With the DRB, actuate the Generator Field.</p> <p>Using a Voltmeter, backprobe the Generator Field Driver Terminal at the back of the Generator.</p> <p>Note: The voltage should cycle from 0 to battery voltage every 1.4 seconds.</p> <p>While monitoring the Voltmeter, wiggle the Field Terminals back to the PCM and ASD Relay.</p> <p>Was there any interruption in the normal cycle between 0 and Battery voltage?</p> <p>Yes → Repair the wire where wiggling interrupted the voltage cycle. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 35</p>	All
35	<p>Ignition On, Engine Not Running</p> <p>With DRB, read Trouble Codes.</p> <p>Are there any Charging System Trouble Codes?</p> <p>Yes → Refer to Symptom list for problems related to charging.</p> <p>No → Go To 36</p>	All
36	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Battery voltage and record.</p> <p>Using a Voltmeter, measure Battery voltage B(+) to B(-) Terminal.</p> <p>Record second voltage reading.</p> <p>Compare the two voltage readings.</p> <p>Is the voltage difference less than one volt?</p> <p>Yes → Go To 37</p> <p>No → Go To 39</p>	All
37	<p>Ignition On, Engine Not Running</p> <p>Using a Voltmeter, measure the voltage between the Generator Case and Battery (-) Side.</p> <p>Start the engine.</p> <p>Is the voltage above 0.1 volt?</p> <p>Yes → Repair Generator Ground high resistance Generator Case to Battery (-) side. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 38</p>	All

CHARGING

* CHARGING SYSTEM NO CODE — Continued

TEST	ACTION	APPLICABILITY
38	<p>Ignition On. Using a Voltmeter, measure between the Generator (12V) B+ Terminal and the Battery (+) side. Start the engine. Is the voltage above 0.4 volt?</p> <p>Yes → Repair the B(+) Circuit for high resistance between the Generator and Battery. Perform Powertrain Verification Test VER-3A.</p> <p>No → Test Complete.</p>	All
39	<p>Ignition On, Engine Not Running Using a Voltmeter, measure the voltage between the Generator Case and Battery (-) Side. Start the engine. Is the voltage above 0.1 volt?</p> <p>Yes → Repair Generator Ground high resistance Generator Case to Battery (-) side. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 40</p>	All
40	<p>Ignition On. Using a Voltmeter, measure between the Generator (12V) B+ Terminal and the Battery (+) side. Start the engine. Is the voltage above 0.4 volt?</p> <p>Yes → Repair the B(+) Circuit for high resistance between the Generator and Battery. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 41</p>	All
41	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Turn Ignition on, with the engine off. Using a Voltmeter, measure the Fused B(+) at PCM Connector. Is the voltage within one volt of the DRB recorded reading?</p> <p>Yes → Repair the B(+) Circuit for high resistance between the PCM Fused B+ and the Battery. Perform Powertrain Verification Test VER-3A.</p> <p>No → Go To 42</p>	All
42	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-3A.</p>	All

Symptom:

*** CHECKING THE BATTERY TEMP SENSOR**

POSSIBLE CAUSES
BATTERY TEMPERATURE SENSOR DEFECTIVE

CHARGING

* CHECKING THE BATTERY TEMP SENSOR — Continued

TEST	ACTION	APPLICABILITY
43	Ignition On, Engine Not Running With DRB Temp Probe read Air/Batt temperature near Battery Temp Sensor. Compare temperature to DRB Battery Temp Sensor reading. Is temperature within 5 degrees of each other? Yes → Test Complete. No → Replace Battery Temp Sensor. Perform Powertrain Verification Test VER-2A.	All

Symptom List:**P-0107 MAP SENSOR VOLTAGE TOO LOW****P-1296 NO 5 VOLTS TO MAP SENSOR**

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be P-0107 MAP SENSOR VOLTAGE TOO LOW.

When Monitored and Set Condition:**P-0107 MAP SENSOR VOLTAGE TOO LOW**

When Monitored: With engine rpm above 416 but less than 3520 and the TP sensor voltage less than 1.13 volt and battery voltage greater than 10.4 volts.

Set Condition: The MAP sensor signal voltage is below .1 volt for 2.0 seconds with engine running.

P-1296 NO 5 VOLTS TO MAP SENSOR

When Monitored: With the ignition off and battery voltage greater than 10.4 volts.

Set Condition: The MAP sensor signal voltage goes below 2.35 volts with key off for 5.0 seconds.

POSSIBLE CAUSES

MAP SENSOR 5-VOLT SUPPLY CIRCUIT OPEN

MAP SENSOR 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

MAP SENSOR HARNESS/CONNECTORS OBSERVABLE DEF

MAP SENSOR SIGNAL CIRCUIT SHORTED TO GROUND

MAP SENSOR SIGNAL CIRCUIT SHORTED TO SENSOR GROUND CIRCUIT

MAP SENSOR WIRING HARNESS/CONNECTORS INTERMITTENT DEF

MAP SENSOR DEFECTIVE

PCM DEF (5-VOLT SUPPLY CIRCUIT OK)

PCM DEF (5-VOLT SUPPLY CIRCUIT VOLTAGE LOW)

DRIVEABILITY

P-0107 MAP SENSOR VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
44	<p>Engine Running. Let engine idle. With the DRB, read the MAP Sensor voltage. Is the MAP Sensor voltage below 1.2 volts?</p> <p>Yes → Go To 46</p> <p>No → Go To 45</p>	All
45	<p>Ignition On, Engine Not Running With the DRB, read the MAP Sensor voltage. Is the MAP Sensor voltage below 3.19 volts?</p> <p>Yes → Go To 46</p> <p>No → Go To 54</p>	All
46	<p>Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. Use a Voltmeter in the following step. Measure the MAP Sensor 5-Volt Supply Circuit. Is the voltage above 4.5 volts?</p> <p>Yes → Go To 47</p> <p>No → Go To 51</p>	All
47	<p>Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. Use the DRB to read MAP Sensor voltage. Is the MAP Sensor voltage above 4.5 volts?</p> <p>Yes → Replace the MAP Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 48</p>	All
48	<p>Ignition Off Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure resistance of MAP Sensor Signal Ckt to gnd. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the MAP Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 49</p>	All

P-0107 MAP SENSOR VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
49	<p>Ignition Off</p> <p>Disconnect the MAP Sensor Electrical Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following step.</p> <p>Measure resistance between the MAP Sensor Signal Circuit and the MAP Sensor Ground Circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair MAP Sensor Signal Circuit shorted to MAP Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 50</p>	All
50	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All
51	<p>Ignition off.</p> <p>Disconnect the MAP Sensor Electrical Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following step.</p> <p>Measure the resistance of the MAP Sensor 5-Volt Supply Circuit from the MAP Sensor Connector to the PCM Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 52</p> <p>No → Repair the open 5-Volt Supply Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
52	<p>Ignition Off</p> <p>Disconnect the MAP Sensor Electrical Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With an Ohmmeter, measure the MAP Sensor 5-Volt Supply Circuit for resistance to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the 5-Volt Supply Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 53</p>	All
53	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0107 MAP SENSOR VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
54	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 55	All
55	Ignition On, Engine Not Running With the DRB, read the MAP Sensor voltage. Wiggle MAP Sensor Connector & Harness. Monitor the DRB display. Was there any MAP Sensor voltage change? Yes → Repair the Harness or Connector that caused the voltage to change. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

Symptom:**P-0108 MAP SENSOR VOLTAGE TOO HIGH****When Monitored and Set Condition:****P-0108 MAP SENSOR VOLTAGE TOO HIGH**

When Monitored: With engine rpm above 400 but less than 3520 and the TP sensor voltage less than 1.13 volt and battery voltage greater than 10.4 volts.

Set Condition: The MAP sensor signal voltage is greater than 4.88 volts at start or with the engine running for 2.2 seconds.

POSSIBLE CAUSES

MAP SENSOR DEFECTIVE

MAP SENSOR GROUND CIRCUIT OPEN

MAP SENSOR WIRING HARNESS INTERMITTENT DEFECT

MAP SENSOR WIRING HARNESS OBSERVABLE DEFECT

MAP SENSOR SIGNAL CIRCUIT OPEN

POWER CONTROL MODULE DEFECTIVE

MAP SENSOR SIGNAL CKT SHORT TO BATTERY VOLTAGE

SENSOR SIGNAL CKT SHORT TO 5-VOLT SUPPLY CIRCUIT

DRIVEABILITY

P-0108 MAP SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
56	<p>Start the engine. With the DRB, read the MAP Sensor voltage. Is the MAP Sensor voltage above 4.6 volts?</p> <p>Yes → Go To 57</p> <p>No → Go To 63</p>	All
57	<p>Ignition On, Engine Not Running Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Connect a jumper wire between the Sensor Signal and Sensor Ground Circuits. With the DRB, read the MAP Sensor voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Replace the MAP Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 58</p>	All
58	<p>Ignition Off Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Ignition on, Engine not running. Connect a Jumper wire from the Sensor Ground Circuit to Engine ground. Read the MAP Sensor voltage. Is the MAP Sensor voltage below 1.0 volt?</p> <p>Yes → Repair the open MAP Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 59</p>	All
59	<p>Ignition Off Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, test the MAP Sensor Signal Circuit for resistance between the PCM Connector and the MAP Sensor Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 60</p> <p>No → Repair the open MAP Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
60	<p>Ignition On, Engine Not Running Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter in the following step, measure the voltage of the MAP Sensor Signal Circuit at the MAP Sensor Connector. Is the voltage above 5.5 volts?</p> <p>Yes → Repair the MAP Sensor Signal shorted to Battery voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 61</p>	All

P-0108 MAP SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
61	<p>Ignition Off Disconnect the MAP Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the MAP Sensor Signal Circuit to 5-volt Supply Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the MAP Sensor Signal Circuit shorted to 5-volts. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 62</p>	All
62	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the Power Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
63	<p>Engine Running Wiggle MAP Sensor Connector and Harness. Monitor the DRB display. Did voltage go above 4.6 volts when wiggled?</p> <p>Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 64</p>	All
64	<p>Ignition Off Using the schematic as a guide, inspect the Harness and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0112 INTAKE AIR TEMPERATURE SENSOR VOLTAGE LOW

When Monitored and Set Condition:

P-0112 INTAKE AIR TEMPERATURE SENSOR VOLTAGE LOW

When Monitored: With the ignition on and battery voltage greater than 10.4 volts.

Set Condition: The intake air sensor circuit voltage at the PCM goes below .08 volt.

POSSIBLE CAUSES
NO POSSIBLE CAUSES REMAINING
IAT SENSOR DEFECTIVE
PCM DEF (IAT SENSOR)
IAT SENSOR WIRING HARNESS INTERMITTENT DEFECT
IAT SENSOR WIRING HARNESS OBSERVABLE DEFECT
SENSOR SIGNAL CIRCUIT SHORT TO GROUND
SENSOR SIGNAL CIRCUIT SHORTED TO SENSOR GROUND

P-0112 INTAKE AIR TEMPERATURE SENSOR VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
65	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Intake Air Temperature Sensor voltage.</p> <p>Is the IAT Sensor voltage below 0.5 volt?</p> <p>Yes → Go To 66</p> <p>No → Go To 70</p>	All
66	<p>Ignition Off</p> <p>Disconnect the Intake Air Temperature Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Ignition on, engine not running.</p> <p>With the DRB, read the Intake Air Temperature Sensor voltage.</p> <p>Is the Intake Air Temperature Sensor voltage above 4.0 volts?</p> <p>Yes → Replace the Intake Air Temperature Sensor.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 67</p>	All
67	<p>Ignition Off</p> <p>Disconnect the Intake Air Temperature Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the IAT Sensor Signal Circuit to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Sensor Signal Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 68</p>	All
68	<p>Ignition Off</p> <p>Disconnect the Intake Air Temperature Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the Sensor Signal and Sensor Ground Circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Sensor Signal Circuit for a short to Sensor Ground.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 69</p>	All
69	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0112 INTAKE AIR TEMPERATURE SENSOR VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
70	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the IAT Sensor voltage.</p> <p>Wiggle the IAT Connector and Harness.</p> <p>Monitor the DRB display.</p> <p>Was there any IAT Sensor voltage change?</p> <p>Yes → Repair the Harness or Connector that caused the voltage change.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 71</p>	All
71	<p>Ignition Off</p> <p>Using the schematic as a guide, inspect the Wiring and Connectors.</p> <p>Were any problems found?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 72</p>	All
72	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC.</p> <p>Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD.</p> <p>If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire.</p> <p>View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses.</p> <p>Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

Symptom:**P-0113 INTAKE AIR TEMPERATURE SENSOR VOLTAGE HIGH****When Monitored and Set Condition:****P-0113 INTAKE AIR TEMPERATURE SENSOR VOLTAGE HIGH**

When Monitored: With the ignition on and battery voltage greater than 10.4 volts.

Set Condition: The intake air sensor circuit voltage at the PCM goes above 4.9 volts.

POSSIBLE CAUSES

IAT SENSOR DEFECTIVE

IAT SENSOR SIGNAL CIRCUIT OPEN

IAT SIGNAL CIRCUIT SHORTED TO VOLTAGE

SENSOR GROUND CIRCUIT OPEN

IAT SENSOR WIRING HARNESS INTERMITTENT DEFECT

IAT SENSOR WIRING HARNESS OBSERVABLE DEFECT

PCM DEF (IAT SEN VOLTAGE HIGH)

DRIVEABILITY

P-0113 INTAKE AIR TEMPERATURE SENSOR VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
73	<p>Ignition On, Engine Not Running With the DRB, read the IAT Sensor voltage. Is the IAT Sensor voltage above 4.5 volts?</p> <p>Yes → Go To 74</p> <p>No → Go To 79</p>	All
74	<p>Ignition Off Disconnect the IAT Sensor. Note: Check connectors - Clean/repair as necessary. Connect a jumper wire across the IAT Signal and Sensor Ground Circuits. Ignition on, engine not running With the DRB, read the IAT Sensor voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Replace the IAT Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 75</p>	All
75	<p>Ignition Off Disconnect the IAT Sensor. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running Using a Voltmeter, measure the voltage of the IAT Signal Circuit. Is the voltage above 6.0 volts?</p> <p>Yes → Repair the IAT Signal Circuit shorted to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 76</p>	All
76	<p>Ignition Off Disconnect the IAT Sensor Electrical Connector. Note: Check connectors - Clean/repair as necessary. Connect a jumper wire from the Sensor ground to an engine ground. Using the DRB, read the IAT Sensor voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Repair the open Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 77</p>	All
77	<p>Ignition Off Disconnect the IAT Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the IAT Sensor Signal for resistance from the PCM to the IAT Sensor Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 78</p> <p>No → Repair the open IAT Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0113 INTAKE AIR TEMPERATURE SENSOR VOLTAGE HIGH —
Continued

TEST	ACTION	APPLICABILITY
78	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All
79	Ignition On, Engine Not Running Wiggle the IAT Sensor Connector and Harness. Monitor DRB display. Was there any IAT Sensor voltage change? Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-5A. No → Go To 80	All
80	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

DRIVEABILITY

Symptom:

P-0117 ECT SENSOR VOLTAGE TOO LOW

When Monitored and Set Condition:

P-0117 ECT SENSOR VOLTAGE TOO LOW

When Monitored: With the ignition on and battery voltage greater than 10.4 volts.

Set Condition: The engine coolant temperature sensor circuit voltage at the PCM goes below .8 volt for more than 3 seconds.

POSSIBLE CAUSES
ECT SENSOR SIGNAL CIRCUIT SHORT TO GROUND
ECT SENSOR SIGNAL CIRCUIT SHORTED TO GROUND CIRCUIT
ECT SENSOR WIRING HARNESS INTERMITTENT DEF
ECT SENSOR WIRING HARNESS OBSERVABLE DEF
ECT SENSOR DEFECTIVE
PCM DEFECTIVE (ECT SENSOR VOLTAGE TOO LOW)

P-0117 ECT SENSOR VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
81	<p>Ignition On, Engine Not Running With the DRB, read the Engine Coolant Temperature Sensor voltage. Is the ECT voltage below 0.5 volt?</p> <p>Yes → Go To 82</p> <p>No → Go To 86</p>	All
82	<p>Ignition Off Disconnect the Engine Coolant Temperature (ECT) Sensor Connector. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running With the DRB, read the ECT Sensor voltage. Is the ECT voltage above 4.0 volts?</p> <p>Yes → Replace the Engine Coolant Temperature Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 83</p>	All
83	<p>Ignition Off Disconnect the Engine Coolant Temperature (ECT) Sensor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the ECT Sensor Signal Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 84</p>	All
84	<p>Ignition Off Disconnect the Engine Coolant Temperature (ECT) Sensor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the resistance between the ECT Sensor Signal Circuit and the Sensor Ground Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the ECT Sensor Signal Circuit shorted to the Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 85</p>	All
85	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0117 ECT SENSOR VOLTAGE TOO LOW — Continued

TEST	ACTION	APPLICABILITY
86	Ignition On, Engine Not Running With the DRB, read the Engine Coolant Temperature Sensor (ECT) voltage. Wiggle the Engine Coolant Temperature Sensor Connector and Harness. Monitor the DRB display. Was there any Engine Coolant Temperature Sensor voltage change? Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-5A. No → Go To 87	All
87	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

Symptom:**P-0118 ECT SENSOR VOLTAGE TOO HIGH****When Monitored and Set Condition:****P-0118 ECT SENSOR VOLTAGE TOO HIGH**

When Monitored: With the ignition on and battery voltage greater than 10.4 volts.

Set Condition: The engine coolant temperature sensor circuit voltage at the PCM goes above 4.98 volts for more than 3 seconds.

POSSIBLE CAUSES

ECT SENSOR GROUND CIRCUIT OPEN

ECT SENSOR SIGNAL CIRCUIT OPEN

ECT SENSOR WIRING HARNESS INTERMITTENT DEFECT

ECT SENSOR WIRING HARNESS OBSERVABLE DEFECT

ENGINE COOLANT TEMPERATURE SENSOR DEFECTIVE

PCM DEFECTIVE (ENGINE COOLANT TEMPERATURE SENSOR)

DRIVEABILITY

P-0118 ECT SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
88	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Engine Coolant Temperature (ECT) Sensor voltage.</p> <p>Is the Engine Coolant Temperature Sensor voltage above 4.5 volts?</p> <p>Yes → Go To 89</p> <p>No → Go To 93</p>	All
89	<p>Ignition Off</p> <p>Disconnect the ECT Sensor Electrical Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper wire from the Sensor Ground to a good engine ground.</p> <p>Ignition on.</p> <p>With the DRB, read the Engine Coolant Temperature Sensor voltage.</p> <p>Is the voltage below 1.0 volt?</p> <p>Yes → Repair the open Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 90</p>	All
90	<p>Ignition Off</p> <p>Disconnect the Engine Coolant Temperature (ECT) Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper between the ECT Sensor Signal Circuit and Sensor Ground Ckt.</p> <p>Ignition on.</p> <p>With the DRB, read the Engine Coolant Temperature Sensor voltage.</p> <p>Is the voltage below 1.0 volt?</p> <p>Yes → Replace the Engine Coolant Temperature Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 91</p>	All
91	<p>Ignition Off</p> <p>Disconnect the Engine Coolant Temperature (ECT) Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following step.</p> <p>Measure the ECT Sensor Signal Circuit for resistance from the PCM to the ECT Sensor Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 92</p> <p>No → Repair the open ECT Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
92	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All

P-0118 ECT SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
93	Ignition On, Engine Not Running With the DRB, read the Engine Coolant Temperature (ECT) Sensor voltage. Wiggle the Engine Coolant Temperature Sensor Connector & Harness. Monitor the DRB display. Was there any Engine Coolant Temperature Sensor voltage change? Yes → Repair the Harness or Connectors that caused the voltage defect. Perform Powertrain Verification Test VER-5A. No → Go To 94	All
94	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

DRIVEABILITY

Symptom:

P-0121 TPS VOLTAGE DOES NOT AGREE WITH MAP

When Monitored and Set Condition:

P-0121 TPS VOLTAGE DOES NOT AGREE WITH MAP

When Monitored: With the engine running and no MAP sensor or TP sensor trouble codes.

Set Condition: Engine speed must be greater than 1600 RPM for all TPS testing.

POSSIBLE CAUSES

TPS HARNESS OR CONNECTORS INTERMITTENT DEFECT
TPS HARNESS OR CONNECTORS OBSERVABLE DEFECT
THROTTLE POSITION SENSOR DEFECTIVE (B)
THROTTLE POSITION SENSOR DEFECTIVE (C)
MAP SENSOR DEFECTIVE
POWERTRAIN CONTROL MODULE DEFECTIVE
THROTTLE POSITION SENSOR DEFECTIVE (A)
TPS 5-VOLT SUPPLY CIRCUIT OPEN

P-0121 TPS VOLTAGE DOES NOT AGREE WITH MAP — Continued

TEST	ACTION	APPLICABILITY
95	<p>Ignition On, Engine Not Running</p> <p>Using the schematic as a guide, wiggle the TP Sensor Harness and Connectors to PCM.</p> <p>While monitoring the DRB, observe for the TP Sensor voltage to change.</p> <p>Did the TP Sensor voltage change at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 96</p>	All
96	<p>Ignition Off</p> <p>Tee in a Vacuum Gauge to a Manifold Vacuum source.</p> <p>Start the engine.</p> <p>Allow the engine to idle.</p> <p>Note: If engine will not idle, maintain a constant RPM above idle.</p> <p>Using the DRB, read the MAP Sensor vacuum.</p> <p>Is the reading within 1" of the teed-in Vacuum Gauge?</p> <p>Yes → Go To 97</p> <p>No → Replace the MAP Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
97	<p>Ignition Off</p> <p>Check the Throttle Plate and Linkage for a binding condition.</p> <p>Ensure the Throttle Linkage is at the idle position.</p> <p>Note: TP Sensor Gnd Circuit and the 5-volt Supply Ckt switched will cause this code to appear.</p> <p>Disconnect the TP Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect TP Sensor Wire colors for the correct cavities.</p> <p>Is any Terminal damaged, pushed out or corroded?</p> <p>Yes → Clean or repair Connector as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 98</p>	All
98	<p>Ignition On, Engine Not Running</p> <p>Ensure the Throttle Linkage is at the idle position.</p> <p>With the DRB, read the Throttle Position Sensor voltage.</p> <p>Is the Throttle Position Sensor voltage above 1.0 volt?</p> <p>Yes → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 99</p>	All
99	<p>Ignition On, Engine Not Running</p> <p>Monitor the DRB voltage reading during the following steps.</p> <p>Slowly open and close the Throttle Plate.</p> <p>Note: You must move Linkage very slowly while looking for a jump in voltage.</p> <p>Is the voltage change smooth?</p> <p>Yes → Go To 100</p> <p>No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0121 TPS VOLTAGE DOES NOT AGREE WITH MAP — Continued

TEST	ACTION	APPLICABILITY
100	Ignition On, Engine Not Running While monitoring the DRB, open the Throttle Plate to wide open Throttle. Is the Throttle Position Sensor voltage above 3.5 volts? Yes → Go To 101 No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.	All
101	Ignition Off Disconnect the TP Sensor. Note: Check connectors - Clean/repair as necessary. Key on. With a Voltmeter, measure the 5-Volt Supply Circuit. Is the voltage below 5.0 volts? Yes → Repair the open 5-Volt supply circuit to TPS. Perform Powertrain Verification Test VER-5A. No → Go To 102	All
102	If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options. Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.	All

Symptom:**P-0122 THROTTLE POSITION SENSOR VOLTAGE LOW****When Monitored and Set Condition:****P-0122 THROTTLE POSITION SENSOR VOLTAGE LOW**

When Monitored: With the ignition on, and battery voltage above 10.4 volts.

Set Condition: The engine coolant temperature sensor circuit voltage at the PCM goes below .8 volt for more than 3 seconds.

POSSIBLE CAUSES

TPS 5-VOLT SUPPLY CIRCUIT OPEN
TPS SIGNAL CIRCUIT SHORT TO GROUND
TPS SIGNAL CIRCUIT SHORTED TO GROUND CIRCUIT
TPS WIRING HARNESS INTERMITTENT DEFECT (RPM)
POWERTRAIN CONTROL MODULE DEFECTIVE
THROTTLE POSITION SENSOR DEF (VOLTAGE > 1.0 VOLT)
THROTTLE POSITION SENSOR DEFECTIVE (V CHANGE)
TRANSMISSION CONTROL MODULE DEFECTIVE (TPS)
TPS WIRING HARNESS INTERMITTENT DEFECT
TPS WIRING HARNESS OBSERVABLE DEFECT

DRIVEABILITY

P-0122 THROTTLE POSITION SENSOR VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
103	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Throttle Position Sensor (TP Sensor) voltage.</p> <p>Is the Throttle Position Sensor voltage below 0.2 volt?</p> <p>Yes → Go To 104</p> <p>No → Go To 110</p>	All
104	<p>Ignition Off</p> <p>Disconnect the Throttle Position Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Turn ignition on.</p> <p>Using a Voltmeter, measure the Throttle Position Sensor 5-Volt Supply Circuit.</p> <p>Is the voltage below 4.0 volts?</p> <p>Yes → Repair the open TP Sensor 5-Volt Supply Circuit.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 105</p>	All
105	<p>Ignition On</p> <p>With the DRB, read the Throttle Position Sensor voltage.</p> <p>Is the voltage above 1.0 volt?</p> <p>Yes → Replace the Throttle Position Sensor.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 106</p>	All
106	<p>Ignition Off</p> <p>Disconnect the Throttle Position Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With an Ohmmeter, measure the TP Sensor Signal Circuit to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the TPS Signal Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 107</p>	All
107	<p>Ignition Off</p> <p>Disconnect the Throttle Position Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following step.</p> <p>Test the resistance between the Sensor Signal Circuit and the Sensor Ground Circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the TPS Signal Circuit shorted to Sensor Ground Circuit.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 108</p>	All

P-0122 THROTTLE POSITION SENSOR VOLTAGE LOW — Continued

TEST	ACTION	APPLICABILITY
108	<p>Ignition Off Disconnect the AW4 Transmission Control Module if equipped. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, read the Throttle Position Sensor voltage. Is the voltage above 1.0 volt?</p> <p>Yes → Replace the AW4 Transmission Control Module. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 109</p>	All
109	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
110	<p>Start engine. Wiggle Throttle Position Sensor Connectors and Harness. Monitor engine RPM. Was there any change in engine RPM when wiggled?</p> <p>Yes → Repair the Harness or Connector that caused the engine RPM to change. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 111</p>	All
111	<p>Ignition On, Engine Not Running With the DRB, read the Throttle Position Sensor (TP Sensor) voltage. While monitoring the DRB, slowly open and close the Throttle. Is the voltage change smooth?</p> <p>Yes → Go To 112</p> <p>No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
112	<p>Ignition On, Engine Not Running With the DRB, read the Throttle Position Sensor (TP Sensor) voltage. Wiggle Throttle Position Sensor Connectors and Harness. Monitor the DRB display. Was there any change in Throttle Position Sensor voltage when wiggled?</p> <p>Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 113</p>	All
113	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0123 THROTTLE POSITION SENSOR VOLTAGE HIGH

When Monitored and Set Condition:

P-0123 THROTTLE POSITION SENSOR VOLTAGE HIGH

When Monitored: With the ignition on, and battery voltage above 10.4 volts.

Set Condition: TP sensor voltage at PCM goes above 4.9 volts for 3.2 seconds.

POSSIBLE CAUSES

THROTTLE POSITION SENSOR GROUND CIRCUIT OPEN

TPS WIRING HARNESS INTERMITTENT DEFECT

TPS WIRING HARNESS OBSERVABLE DEFECT

TPS SIGNAL CIRCUIT SHORTED TO 5-VOLT SUPPLY CIRCUIT

POWERTRAIN CONTROL MODULE DEFECTIVE (TC-27A)

THROTTLE POSITION SENSOR DEFECTIVE (VOLTAGE CHANGE)

TPS DEFECTIVE (VOLTAGE < 1.0 VOLT)

THROTTLE POSITION SENSOR SIGNAL CIRCUIT OPEN

TPS SIGNAL CIRCUIT SHORTED TO VOLTAGE

P-0123 THROTTLE POSITION SENSOR VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
114	<p>Ignition On, Engine Not Running With the DRB, read the Throttle Position Sensor voltage. Is the Throttle Position Sensor voltage above 4.5 volts?</p> <p>Yes → Go To 115</p> <p>No → Go To 121</p>	All
115	<p>Ignition Off Disconnect the TPS Electrical Connector. Note: Check connectors - Clean/repair as necessary. Connect a jumper wire between the TP Sensor Signal Circuit and a good Engine Ground. Read the Throttle Position Sensor voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Repair the open TP Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 116</p>	All
116	<p>Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, read the Throttle Position Sensor voltage. Connect a jumper wire between the TP Sensor Signal Circuit and Sensor Ground Circuit. Does the DRB lose response?</p> <p>Yes → Repair the TP Sensor Signal Circuit shorted to the 5-Volt Supply Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 117</p>	All
117	<p>Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Key on. Using the DRB, read the Throttle Position Sensor voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 118</p>	All
118	<p>Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Key on. With a Voltmeter, measure the Throttle Position Sensor Signal Circuit. Is the voltage above 5.5 volts?</p> <p>Yes → Repair the TP Sensor Signal Circuit shorted to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 119</p>	All

DRIVEABILITY

P-0123 THROTTLE POSITION SENSOR VOLTAGE HIGH — Continued

TEST	ACTION	APPLICABILITY
119	Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure resistance of TP Sensor Signal Circuit from PCM to TP Sensor Connector. Is the resistance below 5.0 ohms? Yes → Go To 120 No → Repair the open TP Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.	All
120	If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options. Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.	All
121	Ignition On, Engine Not Running With the DRB, read the Throttle Position Sensor voltage. Wiggle Throttle Position Sensor Connectors and Harness. Monitor the DRB display. Was there any change in Throttle Position Sensor voltage when wiggled? Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-5A. No → Go To 122	All
122	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 123	All
123	Ignition On, Engine Not Running With the DRB, read the Throttle Position Sensor voltage. While monitoring the DRB, slowly open and close the Throttle. Is the voltage change smooth? Yes → Test Complete. No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-5A.	All

Symptom:**P-0125 CLOSED LOOP TEMP NOT REACHED****When Monitored and Set Condition:****P-0125 CLOSED LOOP TEMP NOT REACHED**

When Monitored: After engine is started, for ten minutes.

Set Condition: The engine temperature does not go above 18 degrees F by 10 minutes after the engine is started. Two trips are required to set this code.

POSSIBLE CAUSES

ECT SENSOR CONN TERMINAL DAMAGED PUSH OUT MISWIRED

ECT SENSOR DEF

PCM CONN TERMINAL DAMAGED PUSHED OUT OR MISWIRED

PCM DEF (COOLANT SYSTEM)

THERMOSTAT DEF

DRIVEABILITY

P-0125 CLOSED LOOP TEMP NOT REACHED — Continued

TEST	ACTION	APPLICABILITY
124	<p>Ignition Off Disconnect the ECT Sensor Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Clean or repair connector as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 125</p>	All
125	<p>Ignition Off Note: This test will be invalid if the Thermostat is stuck open. Run engine until engine temperature is above 180 degrees F. Is the Thermostat operating correctly?</p> <p>Yes → Go To 126</p> <p>No → Replace the Thermostat. Perform Powertrain Verification Test VER-5A.</p>	All
126	<p>Ignition Off Disconnect the ECT Sensor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the ECT Sensor. Is the resistance below 11.0 k ohm?</p> <p>Yes → Go To 127</p> <p>No → Replace the ECT Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
127	<p>Ignition Off Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Clean or repair connector as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 128</p>	All
128	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All

Symptom:**P-0131 1/1 O2S VOLTAGE SHORTED TO GROUND****When Monitored and Set Condition:****P-0131 1/1 O2S VOLTAGE SHORTED TO GROUND**

When Monitored: With engine coolant temperature above 170 degrees F on the previous key on, after a cold start, engine coolant below 98 degrees F, and ambient/battery sensor reading with 27 degrees F of engine coolant.

Set Condition: The oxygen sensor signal voltage is below 0.156 volts for 28 seconds after starting engine.

POSSIBLE CAUSES

O2 SEN 1/1 CON TERM COR, DAMAGE, PUSH OUT, MISWIRE
O2 SEN 1/1 HARNESS OR WIRING INTER SHORT TO GROUND
PCM CONN TERM CORR, PUSH OUT, DAMAGED, OR MISWIRED
O2 SENSOR 1/1 DEF
O2 SEN 1/1 SIGNAL CKT INTERMITTENT SHORT TO GROUND
O2 SEN 1/1 SIGNAL CKT SHORTED FROM PCM TO GROUND
PCM DEF (O2S SHT TO GND)

DRIVEABILITY

P-0131 1/1 O2S VOLTAGE SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
129	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Ignition On, Engine Not Running With the DRB, monitor the 1/1 O2 Sensor voltage. Is the O2 Sensor 1/1 voltage below 0.16 volt?</p> <p>Yes → Go To 130 No → Go To 136</p>	All
130	<p>Ignition Off Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 131</p>	All
131	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running With the DRB, read the 1/1 O2 Sensor voltage. Is the voltage below 0.16 volt?</p> <p>Yes → Go To 132 No → Replace the 1/1 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
132	<p>Ignition Off Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 133</p>	All
133	<p>Ignition Off Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the 1/1 O2 Sensor Signal Circuit from the PCM Connector to ground. Wiggle the O2 Sensor Harness while checking resistance of O2 Sensor Signal Circuit. Did the resistance change while wiggling the Harness?</p> <p>Yes → Repair the 1/1 O2 Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A. No → Go To 134</p>	All

P-0131 1/1 O2S VOLTAGE SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
134	<p>Ignition Off Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the 1/1 O2 Sensor Signal Circuit from the PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the 1/1 O2 Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 135</p>	All
135	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
136	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Ignition On, Engine Not Running Note: A shorted low condition due to water in the Sensor Connector may be temporary. With the DRB, monitor the 1/1 O2 Sensor voltage. Wiggle the 1/1 O2 Sensor Harness and monitor the voltage. Did the 1/1 O2 Sensor voltage change while wiggling wire?</p> <p>Yes → Repair the Harness or Wiring that has the intermittent short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0132 1/1 O2 SENSOR SHORTED TO VOLTAGE

When Monitored and Set Condition:

P-0132 1/1 O2 SENSOR SHORTED TO VOLTAGE

When Monitored: With the engine running for more than 2 minutes and coolant temperature above 170 degrees F.

Set Condition: The oxygen sensor voltage is above 1.2 volts.

POSSIBLE CAUSES

O2 SENSOR 1/1 WIRING HARNESS INTERMITTENT DEFECT
O2 SENSOR 1/1 WIRING HARNESS OBSERVABLE DEFECT
SIGNAL CIRCUIT SHORTED TO VOLTAGE (AT PCM)
SIGNAL CIRCUIT SHORTED TO VOLTAGE (WIRING HARNESS)
O2 SENSOR 1/1 CONNECTOR TERMINAL(S) OBSERVABLE DEF
O2 SENSOR DEFECTIVE 1/1
PCM CONNECTOR TERMINAL(S) OBSERVABLE DEFECT
PCM DEF (1/1 O2 SENSOR)

P-0132 1/1 O2 SENSOR SHORTED TO VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
137	<p>Start the engine. Warm up engine to above 180F, wait 4 minutes, leave engine running. With the DRB, read the O2 Sensor 1/1 voltage. Is the O2 Sensor 1/1 voltage above 1.5 volts?</p> <p>Yes → Go To 138 No → Go To 144</p>	All
138	<p>Ignition off. Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running Using a Voltmeter, measure the O2 Sensor 1/1 Signal Circuit at the PCM Connector. Is the voltage above 5.0 volts?</p> <p>Yes → Repair the 1/1 O2 Sensor Signal Circuit for a short to voltage. Perform Powertrain Verification Test VER-5A. No → Go To 139</p>	All
139	<p>Ignition off. Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running Using a Voltmeter, measure the 1/1 O2 Sensor Signal Circuit voltage at the PCM Connector. Wiggle the O2 Sensor Harness while checking for voltage in the O2 Sensor Signal Circuit. Did the voltage change while wiggling the Harness?</p> <p>Yes → Repair the 1/1 O2 Sensor Signal Circuit for a short to voltage. Perform Powertrain Verification Test VER-5A. No → Go To 140</p>	All
140	<p>Ignition Off Disconnect the 1/1 O2 Sensor.. Note: Check connectors - Clean/repair as necessary. Is any terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 141</p>	All
141	<p>Start the engine. Warm engine to above 180F, wait 4 minutes, leave engine running. Disconnect the O2 Sensor 1/1. Note: Check connectors - Clean/repair as necessary. With the DRB, read the 1/1 O2 Sensor voltage. Is the voltage above 4.97 volts?</p> <p>Yes → Go To 142 No → Replace the 1/1 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0132 1/1 O2 SENSOR SHORTED TO VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
142	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 143</p>	All
143	<p>Ignition Off</p> <p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All
144	<p>Start the engine.</p> <p>Warm up engine to above 180F, wait 4 minutes, leave engine running.</p> <p>With the DRB, read the 1/1 O2 Sensor voltage.</p> <p>Wiggle the 1/1 O2 Sensor Connector and Harness.</p> <p>While wiggling the Harness, watch the DRB display.</p> <p>Did the O2 Sensor 1/1 voltage go above 1.5 volts at any time?</p> <p>Yes → Repair the Harness or Connector that has the intermittent short to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 145</p>	All
145	<p>Ignition Off</p> <p>Inspect the Wiring and Connectors.</p> <p>Were there any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

Symptom:**P-0133 1/1 O2S SLOW RESPONSE****When Monitored and Set Condition:****P-0133 1/1 O2S SLOW RESPONSE**

When Monitored: With engine temp greater than 147 degrees F, after reaching a vehicle speed of 10 mph, and throttle remaining open (off idle) for two minutes, bring vehicle to a stop and allow the engine to idle with transmission in drive (auto) or in neutral (manual).

Set Condition: The oxygen sensor signal voltage is switching from below 0.27 volts to above 0.62 volts and back fewer times than required.

POSSIBLE CAUSES

ENGINE MECHANICAL PROBLEM

1/1 O2 SENSOR GROUND CKT HIGH RESISTANCE

1/1 O2 SENSOR GROUND CKT POOR CONNECTION

1/1 O2 SENSOR SIGNAL CKT HIGH RESISTANCE

1/1 O2 SENSOR SIGNAL CKT POOR CONNECTION

1/1 O2 SENSOR SLOW RESPONSE

EXHAUST LEAK

1/1 O2S SLOW RESPONSE DOES NOT REOCCUR

DRIVEABILITY

P-0133 1/1 O2S SLOW RESPONSE — Continued

TEST	ACTION	APPLICABILITY
146	<p>With the DRB, read the DTCs. Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 150</p> <p>No → Go To 147</p>	All
147	<p>Turn Ignition On (Engine Off). During the following voltage drop measurement, wiggle wires between O2S Connector and PCM Connector. Using a voltmeter, backprobe O2S (Sensor Ground) Circuit between O2S Connector (Sensor Ground) and PCM Connector (Sensor Ground). While wiggling wires, is the voltage drop reading below 0.10 VDC?</p> <p>Yes → Go To 148</p> <p>No → Repair poor connection (high resistance) on O2 Sensor Ground Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All
148	<p>Turn Ignition On (Engine Off). During the following voltage drop measurement, wiggle wires between O2S Connector and PCM Connector. Using a voltmeter, backprobe O2S (Signal) Circuit between O2S Connector (O2S Signal) and PCM Connector (O2S Signal). While wiggling wires, is the voltage drop reading below 0.10 VDC?</p> <p>Yes → Go To 149</p> <p>No → Repair poor connection (high resistance) on O2S Signal Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All
149	<p>At this time the 1/1 O2S SLOW RESPONSE does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME. With this screen, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the 1/1 O2S SLOW RESPONSE reoccur?</p> <p>Yes → Go To 150</p> <p>No → The 1/1 O2S SLOW RESPONSE no longer exists. Perform VERIFICATION TEST VER-5A3.</p>	All
	<p>The following are possible causes for O2 Sensor Slow Response: exhaust leak, fuel contamination, O2 sensor failure, electrical wiring connectors, electrical mechanical, and O2 heater failure. Start the Engine. NOTE: Check the exhaust for excessive smoke caused by oil or coolant consumption. Is there an oil or coolant consumption condition present?</p> <p>Yes → Repair engine mechanical as necessary and replace O2 Sensor. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 151</p>	All

P-0133 1/1 O2S SLOW RESPONSE — Continued

TEST	ACTION	APPLICABILITY
151	<p>The following are possible causes for O2 Sensor Slow Response: exhaust leak, fuel contamination, O2 sensor failure, electrical wiring connectors, electrical mechanical, and O2 heater failure.</p> <p>Start the Engine.</p> <p>Check the Exhaust System for leaks between the Engine and the catalyst.</p> <p>Are there any leaks?</p> <p>Yes → Repair or replace leaking Exhaust System as necessary. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 152</p>	All
152	<p>The following are possible causes for O2 Sensor Slow Response: exhaust leak, fuel contamination, O2 sensor failure, electrical wiring connectors, electrical mechanical, and O2 heater failure.</p> <p>Turn Ignition On (Engine Off).</p> <p>Using a voltmeter, backprobe O2S (Signal) Circuit between O2S Connector (O2S Signal) and PCM Connector (O2S Signal).</p> <p>Is the voltage drop reading below 0.10 VDC?</p> <p>Yes → Go To 153</p> <p>No → Repair poor connection (high resistance) on O2S Signal Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All
153	<p>The following are possible causes for O2 Sensor Slow Response: exhaust leak, fuel contamination, O2 sensor failure, electrical wiring connectors, electrical mechanical, and O2 heater failure.</p> <p>Turn Ignition On (Engine Off).</p> <p>Using a voltmeter, backprobe O2S (Sensor Ground) Circuit between O2S Connector (Sensor Ground) and PCM Connector (Sensor Ground).</p> <p>Is the voltage drop reading below 0.10 VDC?</p> <p>Yes → Replace the O2 Sensor. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Repair poor connection (high resistance) on O2 Sensor Ground Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All

DRIVEABILITY

Symptom:

P-0135 1/1 O2 SENSOR HEATER FAILURE

When Monitored and Set Condition:

P-0135 1/1 O2 SENSOR HEATER FAILURE

When Monitored: With the engine at idle immediately after a cold start (engine < 147 degrees F and battery temp +/- 27 degrees F of engine temperature).

Set Condition: O2 sensor voltage > 3V for 30 to 90 seconds.

POSSIBLE CAUSES
1/1 O2 SENSOR CONNECTOR DAMAGED
1/1 O2 SENSOR GND CIRCUIT OPEN
ASD RELAY OUTPUT CIRCUIT OPEN
1/1 O2 SENSOR FAILURE
1/1 O2 SENSOR HEATER ELEMENT FAILURE
1/1 O2S HEATER FAILURE DOES NOT REOCCUR

P-0135 1/1 O2 SENSOR HEATER FAILURE — Continued

TEST	ACTION	APPLICABILITY
154	<p>With the DRB, read the DTCs. Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 155</p> <p>No → Go To 156</p>	All
155	<p>Turn Ignition On (Engine Off). With the DRB in SENSOR MODE, wait for the 1/1 O2 Sensor voltage to reach 4.5 volts (approximately 3 minutes). With the DRB in ACTUATOR MODE, perform the O2 Sensor Heater Test. Monitor this test for three minutes. Is the 1/1 O2 Sensor voltage above 1.0 volts?</p> <p>Yes → Go To 157</p> <p>No → Go To 156</p>	All
156	<p>At this time the 1/1 O2S HEATER FAILURE does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME. With this screen, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the 1/1 O2S HEATER FAILURE reoccur?</p> <p>Yes → Go To 157</p> <p>No → 1/1 O2S Heater failure no longer exists. Perform VERIFICATION TEST VER-5A3.</p>	All
157	<p>Disconnect the 1/1 O2 Sensor Connector. Check connectors - Clean / repair as necessary. Is any terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 158</p>	All
158	<p>Turn Ignition On (Engine Off). Disconnect the 1/1 O2 Sensor Connector. Check connectors - Clean / repair as necessary. With the DRB in ACTUATOR MODE, perform the O2 Sensor Heater Test. Using a voltmeter, measure the ASD Relay Output Circuit at the O2 Sensor Connector (harness side). Is the voltage above 10.0 volts?</p> <p>Yes → Go To 159</p> <p>No → Repair the open ASD Relay Output Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All
159	<p>Disconnect the 1/1 O2 Sensor Connector. Check connectors - Clean / repair as necessary. Using an ohmmeter, measure the O2 Sensor Heater Element at the O2 Sensor Connector (component side). Is the resistance between 4 and 7 ohms?</p> <p>Yes → Go To 160</p> <p>No → Replace the 1/1 O2 Sensor. Perform VERIFICATION TEST VER-5A3.</p>	All

DRIVEABILITY

P-0135 1/1 O2 SENSOR HEATER FAILURE — Continued

TEST	ACTION	APPLICABILITY
160	Disconnect the 1/1 O2 Sensor Connector. Check connectors - Clean / repair as necessary. Using an ohmmeter, measure from the Heater Ground Circuit to ground at the O2 Sensor Connector (harness side). Is the resistance below 5.0 ohms? Yes → Replace the 1/1 O2 Sensor. Perform VERIFICATION TEST VER-5A3. No → Repair the open 1/1 O2 Sensor Ground Circuit. Perform VERIFICATION TEST VER-5A3.	All

Symptom:**P-0137 1/2 O2S VOLTS SHORTED TO GROUND****When Monitored and Set Condition:****P-0137 1/2 O2S VOLTS SHORTED TO GROUND**

When Monitored: With engine coolant temperature above 170 degrees F on the previous key on, after a cold start, engine coolant below 98 degrees F, and ambient/battery sensor reading within 27 degrees F of engine coolant.

Set Condition: The oxygen sensor signal voltage is below 0.156 volts for 28 seconds after starting engine.

POSSIBLE CAUSES

HARNESS OR WIRING INTERMITTENT SHORT TO GROUND
PCM CONN TERM DAMGD, CORRD, PSHD OUT, OR MSW
SENSOR CONN TERM CORRD, DMGD, PSHD OUT OR MSW
1/2 O2 SENSOR DEF
SIGNAL CIRCUIT INTERMITTENT SHORT TO GROUND
SIGNAL CIRCUIT SHORTED FROM PCM TO GROUND
PCM DEF

DRIVEABILITY

P-0137 1/2 O2S VOLTS SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
161	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Ignition On, Engine Not Running With the DRB, monitor the 1/2 O2 Sensor voltage. Is the 1/2 O2 Sensor voltage below 0.16 volt?</p> <p>Yes → Go To 162 No → Go To 168</p>	All
162	<p>Ignition Off Disconnect the 1/2 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 163</p>	All
163	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Disconnect the 1/2 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running With the DRB, read the 1/2 O2 Sensor voltage. Is the voltage below 0.16 volt?</p> <p>Yes → Go To 164 No → Replace the 1/2 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
164	<p>Ignition Off Disconnect the Powertrain Control Module Connectors. Note: Check connectors - Clean/repair as necessary. Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 165</p>	All
165	<p>Ignition Off Disconnect the 1/2 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the 1/2 O2 Sensor Signal Circuit from the PCM Connector to ground. Wiggle the O2 Sensor Harness while checking resistance of O2 Sensor Signal Circuit. Did the resistance change while wiggling the Harness?</p> <p>Yes → Repair the 1/2 O2 Sensor Signal Circuit for an intermittent short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 166</p>	All

P-0137 1/2 O2S VOLTS SHORTED TO GROUND — Continued

TEST	ACTION	APPLICABILITY
166	<p>Ignition Off Disconnect the 1/2 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Connectors. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the 1/2 O2 Sensor Signal Circuit from the PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the 1/2 O2 Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 167</p>	All
167	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
168	<p>If engine is warm, turn engine off for 15 minutes to allow O2 Sensor to cool down. Ignition On, Engine Not Running Note: A shorted low condition due to water in the Sensor Connector may be temporary. With the DRB, monitor the 1/2 O2 Sensor voltage. Wiggle the 1/2 O2 Sensor Harness and monitor voltage. Did the 1/2 O2 Sensor voltage change while wiggling the Harness?</p> <p>Yes → Repair the Harness or Wiring that has the intermittent short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0138 1/2 OXYGEN SENSOR SHORTED TO VOLTAGE

When Monitored and Set Condition:

P-0138 1/2 OXYGEN SENSOR SHORTED TO VOLTAGE

When Monitored: With the engine running for more than 2 minutes and coolant temperature above 170 degrees F.

Set Condition: The oxygen sensor voltage is above 1.2 volts.

POSSIBLE CAUSES

1/2 O2 SEN WIRING HARNESS OR CONN INTERMITTENT DEF

1/2 O2 SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE

1/2 O2 SENSOR WIRING HARNESS OBSERVABLE DEF

1/2 O2 SENSOR CONNECTOR TERMINAL OBSERVABLE DEF

1/2 O2 SENSOR DEF

PCM CONN/TERM OBS DEFECT

P-0138 1/2 OXYGEN SENSOR SHORTED TO VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
169	<p>Start engine, let idle for at least 5 minutes. With the DRB, read the 1/2 O2 Sensor voltage. Is the 1/2 O2 Sensor voltage above 4.97 volts?</p> <p>Yes → Go To 170</p> <p>No → Go To 172</p>	All
170	<p>Start engine, let idle for at least 5 minutes. Disconnect the 1/2 O2 Sensor Connector. Note: Check connectors - Clean/repair as necessary. With the DRB, read the 1/2 O2 Sensor voltage. Is the 1/2 O2 Sensor voltage above 4.97 volts?</p> <p>Yes → Repair the 1/2 O2 Sensor Signal Circuit for a short to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 171</p>	All
171	<p>If there are no potential causes remaining, the 1/2 O2 Sensor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the 1/2 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
172	<p>Start engine, let idle for at least 5 minutes. With the DRB, read the 1/2 O2 Sensor voltage. Wiggle the 1/2 O2 Sensor Connector and Harness. While wiggling the Harness, watch the DRB display. Did the 1/2 O2 Sensor voltage go above 1.2 volts at any time?</p> <p>Yes → Repair the Harness or Connector that has the intermittent short to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 173</p>	All
173	<p>Ignition Off Using the schematic as a guide, inspect the Wiring. Were there any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 174</p>	All
174	<p>Ignition Off Disconnect the 1/2 O2 Sensor Connector. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 175</p>	All

DRIVEABILITY

P-0138 1/2 OXYGEN SENSOR SHORTED TO VOLTAGE — Continued

TEST	ACTION	APPLICABILITY
175	<p>Ignition Off Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Were there any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A</p> <p>No → Test Complete.</p>	All

Symptom:**P-0141 1/2 O2 SENSOR HEATER FAILURE****When Monitored and Set Condition:****P-0141 1/2 O2 SENSOR HEATER FAILURE**

When Monitored: With the engine at idle immediately after a cold start (engine < 147 degrees F and battery temp +/- 27 degrees F of engine temperature).

Set Condition: O2 sensor voltage > 3 V for 30 to 90 seconds.

POSSIBLE CAUSES

1/2 O2 SENSOR CONNECTOR DAMAGED

1/2 O2 SENSOR GND CIRCUIT OPEN

ASD RELAY OUTPUT CIRCUIT OPEN

1/2 O2 SENSOR FAILURE

1/2 O2 SENSOR HEATER ELEMENT FAILURE

1/2 O2S HEATER FAILURE DOES NOT REOCCUR

DRIVEABILITY

P-0141 1/2 O2 SENSOR HEATER FAILURE — Continued

TEST	ACTION	APPLICABILITY
176	<p>With the DRB, read the DTCs. Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 177</p> <p>No → Go To 178</p>	All
177	<p>Turn Ignition On (Engine Off). With the DRB in SENSOR MODE, wait for the 1/2 O2 Sensor voltage to reach 4.5 volts (approximately 3 minutes). With the DRB in ACTUATOR MODE, perform the O2 Sensor Heater Test. Monitor this test for three minutes. Is the 1/2 O2 Sensor voltage above 1.0 volts?</p> <p>Yes → Go To 179</p> <p>No → Go To 178</p>	All
178	<p>At this time the 1/2 O2S HEATER FAILURE does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME. With this screen, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the 1/2 O2S HEATER FAILURE reoccur?</p> <p>Yes → Go To 179</p> <p>No → 1/2 O2S Heater failure no longer exists. Perform VERIFICATION TEST VER-5A3.</p>	All
179	<p>Disconnect the 1/2 O2 Sensor Connector. Check connectors - Clean / repair as necessary. Is any terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 180</p>	All
180	<p>Turn Ignition On (Engine Off). Disconnect the 1/2 O2 Sensor Connector. Check connectors - Clean / repair as necessary. With the DRB in ACTUATOR MODE, perform the O2 Sensor Heater Test. Using a voltmeter, measure the ASD Relay Output Circuit at the O2 Sensor Connector (harness side). Is the voltage above 10.0 volts?</p> <p>Yes → Go To 181</p> <p>No → Repair the open ASD Relay Output Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All
181	<p>Disconnect the 1/2 O2 Sensor Connector. Check connectors - Clean / repair as necessary. Using an ohmmeter, measure the O2 Sensor Heater Element at the O2 Sensor Connector (component side). Is the resistance between 4 and 7 ohms?</p> <p>Yes → Go To 182</p> <p>No → Replace the 1/2 O2 Sensor. Perform VERIFICATION TEST VER-5A3.</p>	All

P-0141 1/2 O2 SENSOR HEATER FAILURE — Continued

TEST	ACTION	APPLICABILITY
182	<p>Disconnect the 1/2 O2 Sensor Connector.</p> <p>Check connectors - Clean / repair as necessary.</p> <p>Using an ohmmeter, measure from the Heater Ground Circuit to ground at the O2 Sensor Connector (harness side).</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Replace the 1/2 O2 Sensor. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Repair the open 1/2 O2 Sensor Ground Circuit. Perform VERIFICATION TEST VER-5A3.</p>	All

DRIVEABILITY

Symptom List:

P-0171 1/1 FUEL SYSTEM LEAN

P-0172 1/1 FUEL SYSTEM RICH

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be P-0171 1/1 FUEL SYSTEM LEAN.

When Monitored and Set Condition:

P-0171 1/1 FUEL SYSTEM LEAN

When Monitored: With the engine running in closed loop mode and the ambient/battery temperature above 20 degrees F and altitude < 8000 ft.

Set Condition: PCM conducts test to determine whether fuel system is running too lean. If this happens for 2 trips, MIL illuminates & a trouble code is stored. MIL remains on for more than 1 trip but goes out if conditions that set code are not found on subsequent trips

P-0172 1/1 FUEL SYSTEM RICH

When Monitored: With the engine running in closed loop mode and the ambient/battery temperature above 20 degrees F and altitude < 8000 ft.

Set Condition: PCM conducts test to determine whether fuel system is running too rich. If this happens for 2 trips, MIL illuminates & a trouble code is stored. MIL remains on for more than 1 trip but goes out if conditions that set code are not found on subsequent trips

POSSIBLE CAUSES

COOLANT SENSOR CALIBRATION FAILURE

ENGINE MECHANICAL PROBLEM

FUEL PRESSURE OUT OF SPECIFICATION

UPSTREAM O2 SENSOR HEATER DEFECT

FUEL SYSTEM RICH OR LEAN DOES NOT REOCCUR

P-0171 1/1 FUEL SYSTEM LEAN — Continued

TEST	ACTION	APPLICABILITY
183	<p>With the DRB, read the DTCs. Is the Fuel System Rich or Fuel System Lean Good Trip counter displayed and equal to zero?</p> <p>Yes → Go To 185</p> <p>No → Go To 184</p>	All
184	<p>At this time the Fuel System Rich or Fuel System Lean condition does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME AND SIMILAR CONDITIONS WINDOW. With these screens, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the Fuel System Rich or Fuel System Lean condition reoccur?</p> <p>Yes → Go To 185</p> <p>No → The Fuel System Rich or Fuel System Lean condition no longer exists. Perform VERIFICATION TEST VER-5A2.</p>	All
185	<p>Turn Ignition On. With the DRB, read the Engine Coolant Temperature Sensor value. If vehicle temperature is above 180, allow engine to cool until 150 is reached. Start the Engine. While monitoring DRB, allow engine to reach normal operating temperature (above 180 deg). Was the coolant temperature value increase a smooth transition?</p> <p>Yes → Go To 186</p> <p>No → Replace the Coolant Sensor. NOTE: Inspect for mechanical cooling problems before replacing sensor. Perform VERIFICATION TEST VER-5A2.</p>	All
186	<p>With the DRB, actuate the appropriate Upstream O2 Sensor Heater. After 2 minutes of actuation, is the Upstream O2 Sensor voltage on the DRB above 0.1 volts?</p> <p>Yes → Replace the appropriate Upstream O2 Sensor. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Go To 187</p>	All
187	<p>Perform Fuel Pressure Test per service procedures. Is the fuel pressure and volume within specifications?</p> <p>Yes → Go To 188</p> <p>No → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p>	All

DRIVEABILITY

P-0171 1/1 FUEL SYSTEM LEAN — Continued

TEST	ACTION	APPLICABILITY
188	<p>The following additional items should be checked as possible mechanical problems:</p> <p>ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions ENGINE PCV SYSTEM - must flow freely ENGINE DRIVE SPROCKETS - must be properly positioned TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector</p> <p>Are there any mechanical problems?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Test Complete.</p>	All

Symptom:**P-0201 INJECTOR #1 CONTROL CIRCUIT****When Monitored and Set Condition:****P-0201 INJECTOR #1 CONTROL CIRCUIT**

When Monitored: With Battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This trouble code takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 after injector turn off, and with no other injectors on.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN

INJECTOR #1 DEFECTIVE

INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT

INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT

INJECTOR #1 DRIVER CIRCUIT OPEN

INJECTOR #1 DRIVER CIRCUIT SHORTED TO GROUND

POWERTRAIN CONTROL MODULE DEFECTIVE

DRIVEABILITY

P-0201 INJECTOR #1 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
189	<p>Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0?</p> <p>Yes → Go To 190 No → Go To 195</p>	All
190	<p>Ignition Off Disconnect the Injector #1 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #1. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly?</p> <p>Yes → Go To 191 No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
191	<p>Ignition Off Disconnect the #1 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #1 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #1 and observe the voltmeter needle. Does the needle fluctuate?</p> <p>Yes → Replace the #1 Fuel Injector. Perform Powertrain Verification Test VER-5A. No → Go To 192</p>	All
192	<p>Ignition Off Disconnect the #1 Injector Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #1 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 193 No → Repair the open Injector #1 Driver Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0201 INJECTOR #1 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
193	<p>Ignition Off Disconnect the #1 Injector Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #1 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #1 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 194</p>	All
194	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
195	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 196</p>	All
196	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 197</p>	All
197	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

DRIVEABILITY

Symptom:

P-0202 INJECTOR #2 CONTROL CIRCUIT

When Monitored and Set Condition:

P-0202 INJECTOR #2 CONTROL CIRCUIT

When Monitored: With battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This code takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 ms after injector turn off, and with no other injectors on.

POSSIBLE CAUSES
NO POSSIBLE CAUSES REMAINING
AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN
INJECTOR #2 DEFECTIVE
INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT
INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT
INJECTOR #2 DRIVER CIRCUIT OPEN
INJECTOR #2 DRIVER CIRCUIT SHORTED TO GROUND
POWERTRAIN CONTROL MODULE DEFECTIVE

P-0202 INJECTOR #2 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
198	<p>Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0?</p> <p>Yes → Go To 199</p> <p>No → Go To 204</p>	All
199	<p>Ignition Off Disconnect the Injector #2 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #2. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly?</p> <p>Yes → Go To 200</p> <p>No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
200	<p>Ignition Off Disconnect the #2 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #2 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #2 and observe the voltmeter needle. Does the needle fluctuate?</p> <p>Yes → Replace the #2 Fuel Injector. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 201</p>	All
201	<p>Ignition Off Disconnect the #2 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #2 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 202</p> <p>No → Repair the open Injector #2 Driver Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0202 INJECTOR #2 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
202	<p>Ignition Off Disconnect the #2 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #2 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #2 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 203</p>	All
203	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
204	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 205</p>	All
205	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 206</p>	All
206	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

Symptom:**P-0203 INJECTOR #3 CONTROL CIRCUIT****When Monitored and Set Condition:****P-0203 INJECTOR #3 CONTROL CIRCUIT**

When Monitored: With battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This trouble code takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 ms after injector turn off, and with no other injectors on.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN

INJECTOR #3 DEFECTIVE

INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT

INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT

INJECTOR #3 DRIVER CIRCUIT OPEN

INJECTOR #3 DRIVER CIRCUIT SHORTED TO GROUND

POWERTRAIN CONTROL MODULE DEFECTIVE

P-0203 INJECTOR #3 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
207	Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0? Yes → Go To 208 No → Go To 213	All
208	Ignition Off Disconnect the Injector #3 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #3. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly? Yes → Go To 209 No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.	All
209	Ignition Off Disconnect the #3 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #3 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #3 and observe the voltmeter needle. Does the needle fluctuate? Yes → Replace the #3 Fuel Injector. Perform Powertrain Verification Test VER-5A. No → Go To 210	All
210	Ignition Off Disconnect the #3 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #3 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms? Yes → Go To 211 No → Repair the open Injector #3 Driver Circuit. Perform Powertrain Verification Test VER-5A.	All

P-0203 INJECTOR #3 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
211	<p>Ignition Off Disconnect the #3 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #3 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #3 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 212</p>	All
212	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
213	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 214</p>	All
214	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 215</p>	All
215	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

DRIVEABILITY

Symptom:

P-0204 INJECTOR #4 CONTROL CIRCUIT

When Monitored and Set Condition:

P-0204 INJECTOR #4 CONTROL CIRCUIT

When Monitored: with battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This trouble takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 ms after injector turn off, and with no injectors on.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN

INJECTOR #4 DEFECTIVE

INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT

INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT

INJECTOR #4 DRIVER CIRCUIT OPEN

INJECTOR #4 DRIVER CIRCUIT SHORTED TO GROUND

POWERTRAIN CONTROL MODULE DEFECTIVE

P-0204 INJECTOR #4 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
216	<p>Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0?</p> <p>Yes → Go To 217</p> <p>No → Go To 222</p>	All
217	<p>Ignition Off Disconnect the Injector #4 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #4. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly?</p> <p>Yes → Go To 218</p> <p>No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
218	<p>Ignition Off Disconnect the #4 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #4 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #4 and observe the voltmeter needle. Does the needle fluctuate?</p> <p>Yes → Replace the #4 Fuel Injector. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 219</p>	All
219	<p>Ignition Off Disconnect the #4 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #4 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 220</p> <p>No → Repair the open Injector #4 Driver Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0204 INJECTOR #4 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
220	<p>Ignition Off Disconnect the #4 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #4 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #4 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 221</p>	All
221	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
222	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 223</p>	All
223	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 224</p>	All
224	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

Symptom:**P-0205 INJECTOR #5 CONTROL CIRCUIT****When Monitored and Set Condition:****P-0205 INJECTOR #5 CONTROL CIRCUIT**

When Monitored: With battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This trouble code takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 ms after injector turn off, and with no other injectors on.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN

INJECTOR #5 DEFECTIVE

INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT

INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT

INJECTOR #5 DRIVER CIRCUIT OPEN

INJECTOR #5 DRIVER CIRCUIT SHORTED TO GROUND

POWERTRAIN CONTROL MODULE DEFECTIVE

P-0205 INJECTOR #5 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
225	Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0? Yes → Go To 226 No → Go To 231	ENGINE - 4.0L I-6
226	Ignition Off Disconnect the Injector #5 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #5. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly? Yes → Go To 227 No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.	ENGINE - 4.0L I-6
227	Ignition Off Disconnect the #5 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #5 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #5 and observe the voltmeter needle. Does the needle fluctuate? Yes → Replace the #5 Fuel Injector. Perform Powertrain Verification Test VER-5A. No → Go To 228	ENGINE - 4.0L I-6
228	Ignition Off Disconnect the #5 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #5 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms? Yes → Go To 229 No → Repair the open Injector #5 Driver Circuit. Perform Powertrain Verification Test VER-5A.	ENGINE - 4.0L I-6

P-0205 INJECTOR #5 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
229	<p>Ignition Off Disconnect the #5 Injector Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #5 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #5 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 230</p>	ENGINE - 4.0L I-6
230	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	ENGINE - 4.0L I-6
231	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 232</p>	ENGINE - 4.0L I-6
232	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 233</p>	ENGINE - 4.0L I-6
233	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	ENGINE - 4.0L I-6

DRIVEABILITY

Symptom:

P-0206 INJECTOR #6 CONTROL CIRCUIT

When Monitored and Set Condition:

P-0206 INJECTOR #6 CONTROL CIRCUIT

When Monitored: With battery voltage greater than 10.4 volts, the auto shutdown relay energized, injector pulse width less than 10 ms, and engine speed less than 3000 rpm.

Set Condition: This trouble code takes .64 to 10.0 seconds to set when no inductive kick is sensed .18 ms after injector turn off, and with no other injectors on.

POSSIBLE CAUSES
NO POSSIBLE CAUSES REMAINING
AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN
INJECTOR #6 DEFECTIVE
INJ CONTROL CKT WIRING HARNESS INTERMITTENT DEFECT
INJ CONTROL CKT WIRING HARNESS OBSERVABLE DEFECT
INJECTOR #6 DRIVER CIRCUIT OPEN
INJECTOR #6 DRIVER CIRCUIT SHORTED TO GROUND
POWERTRAIN CONTROL MODULE DEFECTIVE

P-0206 INJECTOR #6 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
234	<p>Start engine, let idle for at least 20 seconds. Key on, engine off. With the DRB, read the DTC's. Is the 'DTC specific good trip' counter displayed and equal to 0?</p> <p>Yes → Go To 235 No → Go To 240</p>	ENGINE - 4.0L I-6
235	<p>Ignition Off Disconnect the Injector #6 Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Injector #6. Using a 12-Volt test light connected to ground, check the ASD Relay Output Circuit. Does the test light illuminate brightly?</p> <p>Yes → Go To 236 No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.</p>	ENGINE - 4.0L I-6
236	<p>Ignition Off Disconnect the #6 Injector Connector. Note: Check connectors - Clean/repair as necessary. Use an Analog Voltmeter in the following test step. Note: Pay careful attention to the voltmeter needle in order to have valid test results. Connect the positive lead to a good 12 Volt source (B+) and the negative lead to the Injector #6 Driver Circuit at the Injector Connector. With the DRB, actuate Injector #6 and observe the voltmeter needle. Does the needle fluctuate?</p> <p>Yes → Replace the #6 Fuel Injector. Perform Powertrain Verification Test VER-5A. No → Go To 237</p>	ENGINE - 4.0L I-6
237	<p>Ignition Off Disconnect the #6 Injector Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Injector #6 Driver Circuit from the Injector Connector to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 238 No → Repair the open Injector #6 Driver Circuit. Perform Powertrain Verification Test VER-5A.</p>	ENGINE - 4.0L I-6

DRIVEABILITY

P-0206 INJECTOR #6 CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
238	<p>Ignition Off Disconnect the #6 Injector Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Injector #6 Driver Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Injector #6 Driver Circuit for a short to ground. Note: A shorted Injector Driver Circuit may have ruined the Injector also. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 239</p>	ENGINE - 4.0L I-6
239	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	ENGINE - 4.0L I-6
240	<p>Start Engine Wiggle Wiring Harness from the Injector to the PCM. Does the engine miss or stall?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 241</p>	ENGINE - 4.0L I-6
241	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 242</p>	ENGINE - 4.0L I-6
242	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	ENGINE - 4.0L I-6

Symptom List:

P-0300 MULTIPLE CYLINDER MIS-FIRE
P-0301 CYLINDER #1 MIS-FIRE
P-0302 CYLINDER #2 MIS-FIRE
P-0303 CYLINDER #3 MIS-FIRE
P-0304 CYLINDER #4 MIS-FIRE

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be **P-0300 MULTIPLE CYLINDER MIS-FIRE**.

When Monitored and Set Condition:**P-0300 MULTIPLE CYLINDER MIS-FIRE**

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0301 CYLINDER #1 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0302 CYLINDER #2 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0303 CYLINDER #3 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0304 CYLINDER #4 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0300 MULTIPLE CYLINDER MIS-FIRE — Continued

POSSIBLE CAUSES
MIS-FIRE DOES NOT REOCCUR
OTHER POSSIBLE CAUSES FOR MIS-FIRE
CAM, CRANK, VALVE TIMING, OR VACUUM PROBLEM
ELECTONIC IGNITION COIL OUTPUT LOW
ENGINE MECHANICAL PROBLEM
SECONDARY IGNITION PATTERN IRREGULAR
FUEL CONTAMINATION
FUEL PRESSURE LEAK DOWN OUT OF SPECIFICATION
FUEL PUMP AMPERAGE OUT OF SPECIFICATION
FUEL PUMP CAPACITY OUT OF SPECIFICATION
FUEL PUMP PRESSURE OUT OF SPECIFICATION

P-0300 MULTIPLE CYLINDER MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
243	<p>With the DRB, read the DTCs. Is the MIS-FIRE GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 244</p> <p>No → Go To 245</p>	All
244	<p>At this time the conditions that set this fault are present. With the DRB, read the FREEZE FRAME and SIMILAR CONDITIONS windows. Attempt to operate the vehicle in the similar conditions. When in the SIMILAR CONDITIONS window, go to the WHICH CYLINDER IS MISFIRING monitor. Is the DRB counting mis-fires at this time?</p> <p>Yes → Go To 246</p> <p>No → Go To 245</p>	All
245	<p>At this time the mis-fire does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME AND SIMILAR CONDITIONS WINDOW. With these screens, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the mis-fire reoccur?</p> <p>Yes → Go To 246</p> <p>No → Misfire no longer exists, Test Complete. Perform VERIFICATION TEST VER-5A2.</p>	All
246	<p>With the DRB, read the FREEZE FRAME window. Use the freeze frame data and attempt to determine the cause. In the FREEZE FRAME, are the adaptive fuel percentages greater than +/- 15%?</p> <p>Yes → Go To 247</p> <p>No → Go To 252</p>	All
247	<p>With an appropriate container, obtain a fuel sample from the vehicle. Is the fuel free from contamination?</p> <p>Yes → Go To 248</p> <p>No → Replace contaminated fuel and clean system. Perform VERIFICATION TEST VER-5A2.</p>	All
248	<p>Perform Fuel Pressure Leak Down Test per service instructions. Did the Fuel Pressure Leak Down Test pass?</p> <p>Yes → Go To 249</p> <p>No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.</p>	All
249	<p>Perform Fuel Pump Amperage Test per service instructions. Did the Fuel Pump Amperage Test pass?</p> <p>Yes → Go To 250</p> <p>No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.</p>	All

DRIVEABILITY

P-0300 MULTIPLE CYLINDER MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
250	<p>Perform Fuel Pump Capacity Test per service instructions. Did the Fuel Pump Capacity Test pass?</p> <p>Yes → Go To 251</p> <p>No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.</p>	All
251	<p>Perform Fuel Pump Pressure Test per service instructions. Did the Fuel Pump Pressure Test pass?</p> <p>Yes → Test Complete.</p> <p>No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.</p>	All
252	<p>With the DRB, read the FREEZE FRAME window. Use the freeze frame data and attempt to determine the cause. In the FREEZE FRAME, is the LOAD VALUE over 50% and the temp normal operating temp?</p> <p>Yes → Go To 253</p> <p>No → Go To 256</p>	All
253	<p>Engine Off. Connect a suitable engine analyzer to the engine. Allow the Engine to idle. NOTE: If the Engine will not idle, maintain a constant RPM above idle. NOTE: Set the scope to read display or parade pattern. Remove any spark plug wire. Observe the Secondary KV Line. Is the open secondary voltage at least 25 KV?</p> <p>Yes → Go To 254</p> <p>No → Replace the Electronic Ignition Coil. Perform VERIFICATION TEST VER-5A2.</p>	All
254	<p>Engine Off. Connect a suitable engine analyzer to the engine. Allow the Engine to idle. NOTE: If the Engine will not idle, maintain a constant RPM above idle. NOTE: Set the scope to read display or parade pattern. Follow the equipment manufacturer's procedure for pattern analysis. Is the secondary ignition pattern OK?</p> <p>Yes → Go To 255</p> <p>No → Repair the indicated component in the Secondary Ignition System. Perform VERIFICATION TEST VER-5A2.</p>	All

P-0300 MULTIPLE CYLINDER MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
255	<p>The following additional items should be checked as possible mechanical problems:</p> <p>ENGINE VACUUM - must be at least 13 inches in neutral ENGINE VALVE TIMING - must be within specifications ENGINE COMPRESSION - must be within specifications ENGINE EXHAUST SYSTEM - must be free of any restrictions ENGINE PCV SYSTEM - must flow freely ENGINE DRIVE SPROCKETS - must be properly positioned TORQUE CONVERTER STALL SPEED - must be within specifications POWER BRAKE BOOSTER - no internal vacuum leaks FUEL - must be free of contamination FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector</p> <p>Are there any engine mechanical problems?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Test Complete.</p>	All
256	<p>With the DRB, read the FREEZE FRAME window. Use the freeze frame data and attempt to determine the cause. In the FREEZE FRAME, is the ENGINE RPM over 3000 and the operating temp normal?</p> <p>Yes → Lab scope cam and crank sensor, check valve timing, running vacuum test. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Go To 257</p>	All
257	<p>The following are other possible causes for mis-fire: Injector harness connectors, ignition coil circuit, spark plug, mechanical engine problem, PCM power grounds, irregular cam and crank signal, injectors, restricted exhaust, intake restriction, PCM, Evap System, EGR System, damaged trigger wheel, and accessory drive belts. Do any of the above causes exist?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom List:

P-0305 CYLINDER #5 MIS-FIRE

P-0306 CYLINDER #6 MIS-FIRE

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be **P-0305 CYLINDER #5 MIS-FIRE**.

When Monitored and Set Condition:

P-0305 CYLINDER #5 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

P-0306 CYLINDER #6 MIS-FIRE

When Monitored: With the engine running, after successfully performing a crank sensor learn.

Set Condition: When more than a 2% misfire rate is measured during two trips, or with a 10% to 30% misfire rate during one trip.

POSSIBLE CAUSES

MIS-FIRE DOES NOT REOCCUR

OTHER POSSIBLE CAUSES FOR MIS-FIRE

CAM, CRANK, VALVE TIMING, OR VACUUM PROBLEM

ELECTRONIC IGNITION COIL OUTPUT LOW

ENGINE MECHANICAL PROBLEM

SECONDARY IGNITION PATTERN IRREGULAR

FUEL CONTAMINATION

FUEL PRESSURE LEAK DOWN OUT OF SPECIFICATION

FUEL PUMP AMPERAGE OUT OF SPECIFICATION

FUEL PUMP CAPACITY OUT OF SPECIFICATION

FUEL PUMP PRESSURE OUT OF SPECIFICATION

P-0305 CYLINDER #5 MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
258	With the DRB, read the DTCs. Is the MIS-FIRE GOOD TRIP counter displayed and equal to zero? Yes → Go To 259 No → Go To 260	ENGINE - 4.0L I-6
259	At this time the conditions that set this fault are present. With the DRB, read the FREEZE FRAME and SIMILAR CONDITIONS windows. Attempt to operate the vehicle in the similar conditions. When in the SIMILAR CONDITIONS window, go to the WHICH CYLINDER IS MISFIRING monitor. Is the DRB counting mis-fires at this time? Yes → Go To 261 No → Go To 260	ENGINE - 4.0L I-6
260	At this time the mis-fire does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME AND SIMILAR CONDITIONS WINDOW. With these screens, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the mis-fire reoccur? Yes → Go To 261 No → Misfire no longer exists, Test Complete. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
261	With the DRB, read the FREEZE FRAME window. Use the freeze frame data and attempt to determine the cause. In the FREEZE FRAME, are the adaptive fuel percentages greater than +/- 15 percent? Yes → Go To 262 No → Go To 267	ENGINE - 4.0L I-6
262	With an appropriate container, obtain a fuel sample from the vehicle. Is the fuel free from contamination? Yes → Go To 263 No → Replace contaminated fuel and clean system. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
263	Perform Fuel Pressure Leak Down Test per service instructions. Did the Fuel Pressure Leak Down Test pass? Yes → Go To 264 No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
264	Perform Fuel Pump Amperage Test per service instructions. Did the Fuel Pump Amperage Test pass? Yes → Go To 265 No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6

DRIVEABILITY

P-0305 CYLINDER #5 MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
265	Perform Fuel Pump Capacity Test per service instructions. Did the Fuel Pump Capacity Test pass? Yes → Go To 266 No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
266	Perform Fuel Pump Pressure Test per service instructions. Did the Fuel Pump Pressure Test pass? Yes → Test Complete. No → Relieve fuel pressure and repair as necessary. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
267	With the DRB, read the FREEZE FRAME window. Use the freeze frame data and attempt to determine the cause. In the FREEZE FRAME, is the LOAD VALUE over 50% and the temp normal operating temp? Yes → Go To 268 No → Go To 271	ENGINE - 4.0L I-6
268	Engine Off. Connect a suitable engine analyzer to the engine. Allow the Engine to idle. NOTE: If the Engine will not idle, maintain a constant RPM above idle. NOTE: Set the scope to read display or parade pattern. Remove any spark plug wire. Observe the Secondary KV Line. Is the open secondary voltage at least 25 KV? Yes → Go To 269 No → Replace the Electronic Ignition Coil. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6
269	Engine Off. Connect a suitable engine analyzer to the engine. Allow the Engine to idle. NOTE: If the Engine will not idle, maintain a constant RPM above idle. NOTE: Set the scope to read display or parade pattern. Follow the equipment manufacturer's procedure for pattern analysis. Is the secondary ignition pattern OK? Yes → Go To 270 No → Repair the indicated component in the Secondary Ignition System. Perform VERIFICATION TEST VER-5A2.	ENGINE - 4.0L I-6

P-0305 CYLINDER #5 MIS-FIRE — Continued

TEST	ACTION	APPLICABILITY
270	<p>The following additional items should be checked as possible mechanical problems:</p> <p>ENGINE VACUUM - must be at least 13 inches in neutral</p> <p>ENGINE VALVE TIMING - must be within specifications</p> <p>ENGINE COMPRESSION - must be within specifications</p> <p>ENGINE EXHAUST SYSTEM - must be free of any restrictions</p> <p>ENGINE PCV SYSTEM - must flow freely</p> <p>ENGINE DRIVE SPROCKETS - must be properly positioned</p> <p>TORQUE CONVERTER STALL SPEED - must be within specifications</p> <p>POWER BRAKE BOOSTER - no internal vacuum leaks</p> <p>FUEL - must be free of contamination</p> <p>FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector</p> <p>Are there any engine mechanical problems?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Test Complete.</p>	ENGINE - 4.0L I-6
271	<p>With the DRB, read the FREEZE FRAME window.</p> <p>Use the freeze frame data and attempt to determine the cause.</p> <p>In the FREEZE FRAME, is the ENGINE RPM over 3000 and the operating temp normal?</p> <p>Yes → Lab scope cam and crank sensor, check valve timing, running vacuum test. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Go To 272</p>	ENGINE - 4.0L I-6
272	<p>The following are other possible causes for mis-fire:</p> <p>Injector harness connectors, ignition coil circuit, spark plug, mechanical engine problem, PCM power grounds, irregular cam and crank signal, injectors, restricted exhaust, intake restriction, PCM, Evap System, EGR System, damaged trigger wheel, and accessory drive belts.</p> <p>Do any of the above causes exist?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-5A2.</p> <p>No → Test Complete.</p>	ENGINE - 4.0L I-6

DRIVEABILITY

Symptom:

P-0320 NO CRANK REFERENCE SIGNAL AT PCM

When Monitored and Set Condition:

P-0320 NO CRANK REFERENCE SIGNAL AT PCM

When Monitored: During engine cranking.

Set Condition: No signal from the crank position sensor is present during engine cranking, and at least 3 cam position signals have occurred.

POSSIBLE CAUSES

CKP SENSOR GROUND CIRCUIT OPEN
CKP SENSOR DEF
5-VOLT SUPPLY CIRCUIT OPEN
5-VOLT SUPPLY CIRCUIT SHORT TO GROUND
CKP SIGNAL CIRCUIT OPEN
CKP SIGNAL CIRCUIT SHORT TO GROUND
CKP WIRING HARNESS AND CONNECTOR OBSERVABLE DEF
CKP SENSOR CONN TERM CORR, DAM, PUSHED OUT OR MSWD
PCM DEF (NO CRANK REF SIG AT PCM)
CKP WIRING HARNESS & CONNECTOR INTERMITTENT DEF
PCM CONNECTOR OBSERVABLE DEFECT
PCM CONNECTOR OBSERVABLE DEFECT
INACTIVE TROUBLE CODE

P-0320 NO CRANK REFERENCE SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
273	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the current CKP count and attempt to start the engine. Does the current CKP count change while attempting to start the engine?</p> <p>Yes → Go To 274</p> <p>No → Go To 276</p>	All
274	<p>Ignition Off</p> <p>Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 275</p>	All
275	<p>Engine Running</p> <p>Wiggle the Wiring Harness from CKP Sensor to the Powertrain Control Module. Did the engine die out when wiggling wires?</p> <p>Yes → Repair circuit as necessary where wiggling caused the engine to die out. Perform Powertrain Verification Test VER-2A.</p> <p>No → You have attempted to simulate the condition that set the trouble code. Visually inspect harness connectors, terminals, and related harnesses. Check TSB's also. Perform Powertrain Verification Test VER-2A.</p>	All
276	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 277</p>	All
277	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Turn ignition on.</p> <p>Using a Voltmeter, measure the 5-Volt Supply Circuit. Is the voltage above 4.5 volts?</p> <p>Yes → Go To 278</p> <p>No → Go To 283</p>	All
278	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 279</p>	All

DRIVEABILITY

P-0320 NO CRANK REFERENCE SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
279	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the Sensor Ground Circuit from the CKP Sensor Connector to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 280</p> <p>No → Repair the open Sensor Ground Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
280	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the PCM Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the CKP Signal Circuit from the PCM to the CKP Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 281</p> <p>No → Repair the open CKP Signal Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
281	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the PCM Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the CKP Signal Circuit and ground at the PCM Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the CKP Signal Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 282</p>	All
282	<p>If there are no other potential causes remaining, the CKP Sensor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Crankshaft Position Sensor.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
283	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 284</p>	All

P-0320 NO CRANK REFERENCE SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
284	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the 5-Volt Supply Circuit from the PCM to the CKP Sensor Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 285</p> <p>No → Repair the open 5-Volt Supply Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
285	<p>Ignition Off</p> <p>Disconnect the Crankshaft Position Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module Connectors.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the 5-Volt Supply Circuit from the CKP Sensor Connector to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the 5-Volt Supply Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 286</p>	All
286	<p>If there are no potential causes remaining, the PCM is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the PCM.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

P-0340 NO CAM SIGNAL AT PCM

When Monitored and Set Condition:

P-0340 NO CAM SIGNAL AT PCM

When Monitored: Ignition ON.

Set Condition: If 96 crank signals are counted and no signal from the cam position sensor is present the code will set.

POSSIBLE CAUSES

NO START CONDITION PRESENT

5-VOLT SUPPLY CIRCUIT OPEN

CMP SENSOR CIRCUIT TO HARNESS SPLICE OPEN

CMP SENSOR CONNECTOR OBSERVABLE DEFECT

WIRING AND CONNECTORS OBSERVABLE DEFECT

CAMSHAFT POSITION SENSOR DEFECTIVE

DISTRIBUTOR AND/OR PULSE RING OBSERVABLE DEFECT

PCM DEF (NO CAM SIGNAL)

CMP SEN SIG CIRCUIT SHORT TO 5-VOLT SUPPLY CIRCUIT

CMP SENSOR SIGNAL CIRCUIT OPEN

CMP SENSOR SIGNAL CIRCUIT SHORT TO GROUND

CMP SENSOR SIGNAL CIRCUIT SHORT TO SENSOR GROUND

P-0340 NO CAM SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
287	<p>Ignition On, Engine Not Running With the DRB, read Codes. Is the DTC Specific Good Trip displayed and equal to 0?</p> <p>Yes → Go To 288 No → Go To 300</p>	All
288	<p>Ignition Off Disconnect the Camshaft Position Sensor Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on. Using a Voltmeter, measure the 5-volt Supply Circuit. Is the voltage above 4.0 volts?</p> <p>Yes → Go To 289 No → Repair the open 5-volt Supply Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
289	<p>Ignition Off Disconnect the Camshaft Position Sensor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the CMP Sensor Ground Circuit from the CMP Sensor Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 290 No → Repair the open CMP Sensor Ground Circuit to the Harness Splice. Perform Powertrain Verification Test VER-2A.</p>	All
290	<p>Ignition Off Disconnect the Camshaft Position Sensor Connector. Note: Check connectors - Clean/repair as necessary. Connect one end of a Jumper Wire to the CMP Sensor Signal Circuit. Ignition on with engine not running. With the DRB, monitor the CMP count while tapping the other end of the Jumper to Sensor Ground. Does the current CMP count change?</p> <p>Yes → Go To 291 No → Go To 294</p>	All
291	<p>Ignition Off Disconnect the Camshaft Position Sensor Connector. Note: Check connectors - Clean/repair as necessary. Is any terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A. No → Go To 292</p>	All

DRIVEABILITY

P-0340 NO CAM SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
292	<p>Ignition Off Remove Distributor Cap and Rotor. Inspect the Pulse Ring for damage or misalignment and make sure the pulse ring turns when the engine is cranked. Is the Pulse Ring okay?</p> <p>Yes → Go To 293</p> <p>No → Repair or replace the Distributor and or the Pulse Ring as necessary. Perform Powertrain Verification Test VER-2A.</p>	All
293	<p>If there are no potential causes remaining, the Camshaft Position Sensor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Camshaft Position Sensor. Perform Powertrain Verification Test VER-2A.</p>	All
294	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the CMP Sensor Signal Circuit and the 5-volt Supply Circuit at the CMP Sensor Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the CMP Sensor Signal Circuit for a short to the 5-volt Supply Circuit. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 295</p>	All
295	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the CMP Sensor Signal Circuit from the CMP Sensor Connector to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 296</p> <p>No → Repair the open CMP Sensor Signal Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
296	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the CMP Sensor Signal Circuit to ground at the CMP Sensor Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the CMP Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 297</p>	All

P-0340 NO CAM SIGNAL AT PCM — Continued

TEST	ACTION	APPLICABILITY
297	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the CMP Sensor Signal Circuit and the Sensor Ground Circuit at the CMP Sensor Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the CMP Sensor Signal Circuit for a short to the Sensor Ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 298</p>	All
298	<p>Ignition Off Disconnect the Camshaft Position Sensor Connector. Note: Check connectors - Clean/repair as necessary. Is any terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 299</p>	All
299	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p>	All
300	<p>Ignition Off Attempt to start the engine. Does the engine start?</p> <p>Yes → Go To 301</p> <p>No → Refer to Symptom list for further diagnostic tests.</p>	All
301	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0351 IGNITION COIL #1 PRIMARY CIRCUIT

When Monitored and Set Condition:

P-0351 IGNITION COIL #1 PRIMARY CIRCUIT

When Monitored: With battery voltage greater than 8 volts during engine cranking or greater than 12 volts with engine running, and with engine rpm less than 2016.

Set Condition: Peak current is not achieved with battery based dwell plus 1.5 msec of diagnostic offset. It takes less than 3 seconds during cranking or up to 6 seconds while running to set.

POSSIBLE CAUSES

ASD RELAY OUTPUT CIRCUIT OPEN
IGN COIL #1 WIRING HARN/CONN INTERMITTENT DEFECT
IGN COIL #1 WIRING HARN/CONN OBSERVABLE DEF
IGNITION COIL #1 DRIVER CIRCUIT OPEN
IGNITION COIL #1 DRIVER CIRCUIT SHORTED TO GROUND
IGNITION COIL CONNECTOR TERMINAL OBSER DEF
IGNITION COIL DEF
PCM DEFECTIVE (#1 IGNITION COIL CIRCUIT DRIVER)

P-0351 IGNITION COIL #1 PRIMARY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
302	<p>With the DRB, read the DTC's. Is the DTC SPECIFIC GOOD TRIP displayed and equal to zero?</p> <p>Yes → Go To 303</p> <p>No → Go To 309</p>	All
303	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 304</p>	All
304	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate Ignition Coil #1. With a 12 volt test light connected to ground, check the ASD Relay Output. Does the test light illuminate brightly?</p> <p>Yes → Go To 305</p> <p>No → Repair the open/high resistance in the ASD Relay Output Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
305	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Connect a test light to a good 12 volt source (B+). Check the #1 Ignition Coil Driver circuit with the test light while cranking the engine. does the test light blink/flicker?</p> <p>Yes → Replace the Ignition Coil. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 306</p>	All
306	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Measure the Ignition Coil #1 Driver Circuit for resistance from the PCM Connector to the Ignition Coil Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 307</p> <p>No → Repair the Ignition Coil #1 Driver Circuit for an open or high resistance problem. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0351 IGNITION COIL #1 PRIMARY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
307	Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Ignition Coil #1 Driver Circuit to ground. Is the resistance below 5.0 ohms? Yes → Repair the Ignition Coil #1 Driver Circuit for a short to ground. Perform Powertrain Verification Test VER-5A. No → Go To 308	All
308	If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All
309	Start the Engine. Wiggle Wiring Harness from the Ignition Coil to the Powertrain Control Module. Did the Engine start to miss or did the Good Trip Counter change to zero? Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A. No → Go To 310	All
310	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

Symptom:**P-0420 1/1 CATALYTIC CONVERTER EFFICIENCY****When Monitored and Set Condition:****P-0420 1/1 CATALYTIC CONVERTER EFFICIENCY**

When Monitored: After engine warm up to 147 degrees F, 180 seconds of open throttle operation, at a speed greater than 20 mph, with the engine at 1200-1700 rpm and MAP vacuum between 15.0 and 21.0 inches of mercury (Hg).

Set Condition: As catalyst efficiency deteriorates, the switch rate of the downstream O2 sensor approaches that of the upstream O2 sensor. If at any point during the test the switch ratio reaches a predetermined value, a counter is incremented by one.

POSSIBLE CAUSES

EXHAUST LEAK

ENGINE MECHANICAL PROBLEM

CATALYTIC CONVERTER DEFECTIVE

UPSTREAM O2 SENSOR OLDER THAN DOWNSTREAM O2 SENSOR

CATALYST EFFICIENCY FAILURE DOES NOT REOCCUR

DRIVEABILITY

P-0420 1/1 CATALYTIC CONVERTER EFFICIENCY — Continued

TEST	ACTION	APPLICABILITY
311	<p>With the DRB, read the DTCs. Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 313</p> <p>No → Go To 312</p>	All
312	<p>At this time the Catalyst Efficiency Failure does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME. With this screen, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the Catalyst Efficiency Failure Reoccur?</p> <p>Yes → Go To 313</p> <p>No → The Catalytic Converter Efficiency Failure no longer exists. Perform VERIFICATION TEST VER-5A3.</p>	All
313	<p>Start Engine and let idle. Check for exhaust leaks between the Engine and the appropriate Downstream O2 Sensor. Are there any exhaust leaks?</p> <p>Yes → Repair or replace leaking exhaust parts as necessary. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 314</p>	All
314	<p>NOTE: Check the exhaust for excessive smoke from internal oil or coolant leaks. Is there an oil or coolant consumption condition present?</p> <p>Yes → Repair engine mechanical as necessary and replace Catalytic Converter. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Go To 315</p>	All
315	<p>NOTE: A new Downstream O2 Sensor along with an aging Upstream O2 Sensor may cause this trouble code to set. Review vehicle repair history. Has the Downstream O2 Sensor been replaced without replacing the Upstream O2 Sensor?</p> <p>Yes → Replace the appropriate Upstream Oxygen Sensor. Perform VERIFICATION TEST VER-5A3.</p> <p>No → Replace the Catalytic Converter. Perform VERIFICATION TEST VER-5A3.</p>	All

Symptom:**P-0441 EVAP PURGE FLOW MONITOR FAILURE****When Monitored and Set Condition:****P-0441 EVAP PURGE FLOW MONITOR FAILURE**

When Monitored: See DRB III.

Set Condition: See DRB III.

POSSIBLE CAUSES

PURGE CANISTER LINE DAMAGED

PURGE SOLENOID AND CANISTER DEFECTIVE

PURGE SOLENOID DEFECTIVE

VACUUM HOSES DAMAGED OR PLUGGED

EVAP PURGE MONITOR FAILURE DOES NOT REOCCUR

DRIVEABILITY

P-0441 EVAP PURGE FLOW MONITOR FAILURE — Continued

TEST	ACTION	APPLICABILITY
316	With the DRB, read the DTCs. Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero? Yes → Go To 318 No → Go To 317	All
317	At this time the Evap Purge Flow Monitor Failure does not exist or is an intermittent problem. With the DRB, read the FREEZE FRAME and PURGE FLOW PRE-TEST. With these screens, attempt to duplicate the condition that has set this fault. While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum. Does the Evap Purge Flow Monitor Failure reoccur? Yes → Go To 318 No → The Evap Purge Flow Monitor failure no longer exists. Perform VERIFICATION TEST VER-5A3.	All
318	NOTE: Carefully inspect all vacuum hoses for proper routing and for pinched or plugged hoses from the engine to the solenoid to the gas tank. Are all vacuum hoses OK? Yes → Go To 319 No → Repair the vacuum hoses as necessary. Perform VERIFICATION TEST VER-5A3.	All
319	Remove Purge Solenoid and tap the ports against a clean solid surface. Did any foreign material fall out? Yes → Go To 320 No → Replace the Purge Solenoid. Perform VERIFICATION TEST VER-5A3.	All
320	Inspect the line from the Purge Solenoid to the Canister. Is the line disconnected, ripped, or cut? Yes → Repair the line and replace Purge Solenoid. Perform VERIFICATION TEST VER-5A3. No → Clean out line and replace Purge Solenoid and Canister. Perform VERIFICATION TEST VER-5A3.	All

Symptom List:**P-0442 EVAP LEAK MONITOR SMALL LEAK DETECTED****P-0455 EVAP LEAK MONITOR LARGE LEAK DETECTED**

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be **P-0442 EVAP LEAK MONITOR SMALL LEAK DETECTED**.

When Monitored and Set Condition:**P-0442 EVAP LEAK MONITOR SMALL LEAK DETECTED**

When Monitored: See DRB III.

Set Condition: See DRB III.

P-0455 EVAP LEAK MONITOR LARGE LEAK DETECTED

When Monitored: See DRB III.

Set Condition: See DRB III.

POSSIBLE CAUSES

EVAP SYSTEM HOSES OR WIRING DAMAGED

EVAP SYSTEM COMPONENT LEAKING

LEAK DETECTION PUMP LEAKING

EVAP LEAK MONITOR SMALL OR LARGE DOES NOT REOCCUR

DRIVEABILITY

P-0442 EVAP LEAK MONITOR SMALL LEAK DETECTED — Continued

TEST	ACTION	APPLICABILITY
321	<p>NOTE: Replacing the Powertrain Control Module will not correct this problem.</p> <p>With the DRB, read the DTCs.</p> <p>Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 323</p> <p>No → Go To 322</p>	All
322	<p>At this time the Evap Leak Monitor Small or Large Leak Detected does not exist or is an intermittent problem.</p> <p>With the DRB, read the FREEZE FRAME.</p> <p>With this screen, attempt to duplicate the condition that has set this fault.</p> <p>While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum.</p> <p>Does the Evap Leak Monitor Small or Large Leak Detected Reoccur?</p> <p>Yes → Go To 323</p> <p>No → The Evap Leak Monitor Small or Large Leak Detected no longer exists.</p> <p>Perform VERIFICATION TEST VER-6A.</p>	All
323	<p>NOTE: A defective Secondary Seal in the Fuel Filler Neck or leaving the Gas Cap loose could cause this trouble code to set.</p> <p>To continue testing you will need Miller Tool Kit #6872A and #6922.</p> <p>NOTE: The Fuel Tank must have 1/2 tank of fuel to perform this test.</p> <p>Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover.</p> <p>Warning: Verify the vehicle fuel tank contains at least 3 gallons of fuel.</p> <p>Attach the DRB III to the vehicle.</p> <p>Turn the Key On.</p> <p>At: ENGINE SYSTEM TESTS select: LEAK DETECTION PUMP TEST.</p> <p>Read instructions and then press ENTER.</p> <p>At: LEAK DETECTION PUMP TEST select #3 HOLD PSI.</p> <p>At the vacuum hose going to the LDP, attach and apply a continuous vacuum (i.e. 20" Hg).</p> <p>Remove Gas Cap.</p> <p>Install 6922 on the Gas Cap and on the vehicle.</p> <p>Attach the supply hose from 6872A to 6922.</p> <p>Attach the power source from the 6872A, clip to Battery(+) and ground clip to Battery(-).</p> <p>On the 6872A set the Pressure/Hold Valve to Open and set the Vent Valve to Closed.</p> <p>Turn the timer on and watch the gauge.</p> <p>When the gauge pressure reaches 14 in. H₂O, turn the Pressure/Hold Valve to Closed.</p> <p>Turn the timer off. Note the time and pressure.</p> <p>Did pressure drop more than 6 in. H₂O (to 8 inches H₂O on the gauge) in two minutes?</p> <p>Yes → Go To 324</p> <p>No → Go To 325</p>	All

P-0442 EVAP LEAK MONITOR SMALL LEAK DETECTED — Continued

TEST	ACTION	APPLICABILITY
324	<p>To continue testing you will need Miller Tool Kit #6872A, #6922 and #6904 Ultrasonic Leak Detector.</p> <p>NOTE: The Fuel Tank must have 1/2 tank of fuel to perform this test.</p> <p>Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover.</p> <p>Warning: Verify the vehicle fuel tank contains at least 3 gallons of fuel.</p> <p>Attach the DRB III to the vehicle.</p> <p>Turn the Key On.</p> <p>At: ENGINE SYSTEM TESTS select: LEAK DETECTION PUMP TEST.</p> <p>Read instructions and then press ENTER.</p> <p>At: LEAK DETECTION PUMP TEST select #3 HOLD PSI.</p> <p>At the vacuum hose going to the LDP, attach and apply a continuous vacuum (i.e. 20" Hg).</p> <p>Remove Gas Cap.</p> <p>Install 6922 on the Gas Cap and on the vehicle.</p> <p>Attach the supply hose from 6872A to 6922.</p> <p>Attach the power source from the 6872A, clip to Battery(+) and ground clip to Battery(-).</p> <p>Set Pressure Hold to Open and set Vent to Open.</p> <p>Turn Pump Timer On.</p> <p>To prevent noise from interfering with test, move tool #6872 away from vehicle.</p> <p>Using the Ultrasonic Leak Detector, start listening for leaks at Gas Cap then proceed to Rollover Valve, Canister, Leak Detection Pump, and Evap Purge Solenoid.</p> <p>Were any leaks heard with the Ultrasonic Leak Detector?</p> <p>Yes → Repair or replace leaking component. Perform VERIFICATION TEST VER-6A.</p> <p>No → Replace Leak Detection Pump. Perform VERIFICATION TEST VER-6A.</p>	All
325	<p>At this time, the condition required to set the code is not present.</p> <p>Using the schematic as a guide, inspect the wiring, connectors and hoses.</p> <p>Were any problems found?</p> <p>Yes → Repair as necessary. Perform VERIFICATION TEST VER-6A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-0443 EVAP PURGE SOLENOID CIRCUIT

When Monitored and Set Condition:

P-0443 EVAP PURGE SOLENOID CIRCUIT

When Monitored: At ignition key on and battery voltage greater than 10.4 volts.

Set Condition: After the arming conditions are satisfied: not powering down, not already in limp-in, time since the last solenoid activation > 72 micro seconds. The PCM will set a trouble code if the actual state of the solenoid does not match the intended state.

POSSIBLE CAUSES

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
EVAP PURGE SOL CKT WRG HARNESS INTERMITTENT DEFECT
EVAP PURGE SOL CKT WRG HARNESS OBSERVABLE DEFECT
EVAP PURGE SOLENOID CONTROL CIRCUIT OPEN
EVAP PURGE SOLENOID CTRL CIRCUIT SHORTED TO GROUND
EVAPORATIVE PURGE SOLENOID DEFECTIVE
PCM DEFECTIVE (EVAPORATIVE PURGE SOLENOID CIRCUIT)

P-0443 EVAP PURGE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
326	<p>Ignition On, Engine Not Running With the DRB, read Codes. Is the DTC Specific Good Trip displayed and equal to 0?</p> <p>Yes → Go To 327</p> <p>No → Go To 332</p>	All
327	<p>Ignition Off Disconnect Evap Purge Solenoid Connector. Note: Check connectors - Clean/repair as necessary. Key on. Using a Voltmeter, measure the voltage of the Fused Ignition Switch Output Circuit at Solenoid Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 328</p> <p>No → Repair the open Fused Ignition Switch Output Ckt. Perform Powertrain Verification Test VER-5A.</p>	All
328	<p>Ignition Off Disconnect Evap Purge Solenoid Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Evap Purge Solenoid Control Circuit from the Powertrain Control Module to the Evap Solenoid Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 329</p> <p>No → Repair the open Evap Purge Solenoid Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
329	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Key on. Using a Voltmeter, measure the Evap Purge Solenoid Control Circuit at the PCM Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 330</p> <p>No → Replace the Evap Purge Solenoid. Perform Powertrain Verification Test VER-5A.</p>	All
330	<p>Ignition Off Disconnect Evap Purge Solenoid Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Evap Purge Solenoid Control Circuit to ground at PCM Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Evap Purge Solenoid Control Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 331</p>	All

DRIVEABILITY

P-0443 EVAP PURGE SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
331	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.	All
332	Ignition On, Engine Not Running With the DRB, read codes. Note: With the DRB, start actuator test. Wiggle Wiring Harness from the Solenoid to PCM. Does the Evap Purge Solenoid Control Circuit code return? Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-5A. No → Go To 333	All
333	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

Symptom:**P-0460 FUEL LEVEL UNIT NO CHANGE OVER MILES****When Monitored and Set Condition:****P-0460 FUEL LEVEL UNIT NO CHANGE OVER MILES**

When Monitored: Engine running and fuel level either below 15% or above 85% of capacity.

Set Condition: The PCM sees low fuel, less than 15%, for more than 120 miles or fuel level stays above 85% of capacity and does not change by at least 10% for more than 100 miles.

POSSIBLE CAUSES

FUEL LEVEL SENDING UNIT VOLTAGE OUT OF SPECIFICATION

FUEL LVL SENSOR WIRING HARNESS OBSERVABLE DEF (1)

FUEL LEVEL SENSOR DEFECTIVE (ADD FUEL)

DRIVEABILITY

P-0460 FUEL LEVEL UNIT NO CHANGE OVER MILES — Continued

TEST	ACTION	APPLICABILITY
334	<p>Ignition On, Engine Not Running With the DRB, read the Fuel Level Sending Unit voltage and make a note of voltage. Is the Fuel Level Sensor voltage below 0.4 volts?</p> <p>Yes → Refer to symptom P-0462 FUEL LEVEL SENDING UNIT VOLTS TOO LOW in the DRIVEABILITY category.</p> <p>No → Go To 335</p>	All
335	<p>Ignition On, Engine Not Running With the DRB, read the Fuel Level Sending Unit voltage and make a note of voltage. Is Fuel Level Sending Unit voltage above 9.4 volts?</p> <p>Yes → Refer to symptom P-0463 FUEL LEVEL SENDING UNIT VOLTS TOO HIGH in the DRIVEABILITY category.</p> <p>No → Go To 336</p>	All
336	<p>Ignition On, Engine Not Running With the DRB, read the Fuel Level Sending Unit voltage and make a note of voltage. Is the Fuel Level Sending Unit voltage between 5.0 and 9.4 volts?</p> <p>Yes → Go To 337</p> <p>No → Go To 339</p>	All
337	<p>Ignition Off Add at least five gallons of fuel to fuel tank. Key on. With the DRB, read the Fuel Level Sensor voltage. Did the Fuel Level Sensor voltage decrease by at least 0.2 volt?</p> <p>Yes → Go To 338</p> <p>No → Replace the Fuel Level Sensor. Perform Powertrain Verification Test VER-2A.</p>	All
338	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Test Complete.</p>	All
339	<p>Ignition On With the DRB, read the Fuel Level Sending Unit voltage and make a note of voltage. Is the Fuel Level Sensor voltage between 0.4 and 2.0 volts?</p> <p>Yes → Test Complete.</p> <p>No → At this time the condition required to set the code is not present.</p>	All

Symptom:**P-0461 FUEL LEVEL UNIT NO CHANGE OVER TIME****When Monitored and Set Condition:****P-0461 FUEL LEVEL UNIT NO CHANGE OVER TIME**

When Monitored: Ignition on, battery voltage above 10.4 volts.

Set Condition: The Fuel Level Sensor voltage at the PCM stays between 9.56 volts and 9.90 volts for more than 255 seconds.

POSSIBLE CAUSES

FUEL LEVEL SENSOR DEFECTIVE

FUEL TANK DEFECTIVE

DRIVEABILITY

P-0461 FUEL LEVEL UNIT NO CHANGE OVER TIME — Continued

TEST	ACTION	APPLICABILITY
340	Ignition Off Remove the Fuel Tank using the proper removal and installation procedure. Remove the Fuel Pump Module from the Fuel Tank. Inspect the inside of the Fuel Tank for any obstructions or deformities. Is the Fuel Tank free from defects? Yes → Go To 341 No → Repair or replace Fuel Tank as necessary. Perform Powertrain Verification Test VER-2A.	All
341	If there are no potential causes remaining, the Fuel Level Sensor is assumed to be defective. View repair options. Repair Replace the Fuel Level Sensor. Perform Powertrain Verification Test VER-2A.	All

Symptom:**P-0462 FUEL LEVEL SENDING UNIT VOLTS TOO LOW****When Monitored and Set Condition:****P-0462 FUEL LEVEL SENDING UNIT VOLTS TOO LOW**

When Monitored: Ignition on and battery voltage above 10.4 volts.

Set Condition: The fuel level sensor signal circuit voltage at the PCM goes below .4 volts for 4 seconds.

POSSIBLE CAUSES

FUEL LEVEL SENSOR DEFECTIVE

POWERTRAIN CONTROL MODULE DEFECTIVE

FUEL LEVEL SENSOR SIGNAL CIRCUIT SHORTED TO GROUND

FUEL LEVEL SENSOR SIGNAL CKT SHORT TO SENSOR GND CKT

FUEL LEVEL SENSOR WIRING HARN INTERMITTENT DEFECT

FUEL LEVEL SENSOR WIRING HARNESS OBSERVABLE DEFECT

DRIVEABILITY

P-0462 FUEL LEVEL SENDING UNIT VOLTS TOO LOW — Continued

TEST	ACTION	APPLICABILITY
342	<p>Ignition On, Engine Not Running With the DRB, read the Fuel Level Sensor Voltage. Is Fuel Level voltage below 0.4 volt?</p> <p>Yes → Go To 343 No → Go To 347</p>	All
343	<p>Ignition Off Disconnect the Fuel Pump Module Connector. Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. With the DRB, read the Fuel Level Sensor voltage. Is the Fuel Level Sensor voltage above 9.0 volts?</p> <p>Yes → Replace the Fuel Level Sensor. Perform Powertrain Verification Test VER-2A. No → Go To 344</p>	All
344	<p>Ignition Off Disconnect the Fuel Pump Module Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Fuel Level Sensor Signal Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Fuel Level Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-2A. No → Go To 345</p>	All
345	<p>Ignition Off Disconnect the Fuel Pump Module Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the resistance between the Fuel Level Sensor Signal Circuit and the Sensor Ground Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Fuel Level Sensor Signal Circuit short to the Sensor Ground Circuit. Perform Powertrain Verification Test VER-2A. No → Go To 346</p>	All
346	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p>	All

P-0462 FUEL LEVEL SENDING UNIT VOLTS TOO LOW — Continued

TEST	ACTION	APPLICABILITY
347	Ignition On, Engine Not Running Using the schematic, wiggle the Fuel Pump Module Connector & Harness. Monitor the DRB Display. Was there any Fuel Level Sensor voltage change? Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-2A. No → Go To 348	All
348	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A. No → Test Complete.	All

DRIVEABILITY

Symptom:

P-0463 FUEL LEVEL SENDING UNIT VOLTS TOO HIGH

When Monitored and Set Condition:

P-0463 FUEL LEVEL SENDING UNIT VOLTS TOO HIGH

When Monitored: Ignition on and battery voltage above 10.4 volts.

Set Condition: The fuel level sensor signal circuit voltage at the PCM goes above 9.4 volts for 2 seconds.

POSSIBLE CAUSES
FUEL LEVEL SENSOR SIGNAL CIRCUIT OPEN
SENSOR GROUND CIRCUIT OPEN
FUEL LEVEL SENSOR DEFECTIVE
FUEL LEVEL SENSOR WIRING HARNESS INTERMITTENT DEFECT
FUEL LEVEL SENSOR WIRING HARNESS OBSERVABLE DEFECT
POWERTRAIN CONTROL MODULE DEFECTIVE

P-0463 FUEL LEVEL SENDING UNIT VOLTS TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
349	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Fuel Level Sensor voltage.</p> <p>Is the Fuel Level Sensor voltage above 9.4 volts?</p> <p>Yes → Go To 350</p> <p>No → Go To 354</p>	All
350	<p>Disconnect the Fuel Pump Module Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper between Fuel Level Sensor Signal and Sensor Ground Circuit.</p> <p>Key on.</p> <p>With the DRB, read the Fuel Level Sensor voltage.</p> <p>Is the voltage below 1.0 volt?</p> <p>Yes → Replace the Fuel Level Sensor.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 351</p>	All
351	<p>Ignition Off</p> <p>Disconnect the Fuel Pump Module Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper between the Fuel level Sensor Signal and a known good ground.</p> <p>Ignition on, engine not running.</p> <p>With the DRB, read the Fuel Level Sensor voltage.</p> <p>Is the voltage below 1.0 volt?</p> <p>Yes → Repair the open Sensor Ground Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 352</p>	All
352	<p>Ignition Off</p> <p>Disconnect the Fuel Pump Module Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Use an Ohmmeter in the following step.</p> <p>Measure the Fuel Level Sensor Signal Circuit from the PCM to the Fuel Pump Module Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 353</p> <p>No → Repair the open Fuel Level Sensor Signal Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
353	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

P-0463 FUEL LEVEL SENDING UNIT VOLTS TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
354	Ignition On, Engine Not Running With the DRB, read the Fuel Level Sensor voltage. Use the schematic as a guide and wiggle the Fuel Pump Module Connector & Harness. Monitor the DRB display. Was there any Fuel Level Sensor voltage change? Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-2A. No → Go To 355	All
355	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A. No → Test Complete.	All

Symptom:**P-0500 NO VEHICLE SPEED SENSOR SIGNAL****When Monitored and Set Condition:****P-0500 NO VEHICLE SPEED SENSOR SIGNAL**

When Monitored: With engine temperature greater than 104 degrees F, MAP approximately 350 torr, (or MAP vacuum 15 to 16"), and engine speed between 1400 and 3000 RPM.

Set Condition: No signal from the vehicle speed sensor for more than 15 seconds on two (2) consecutive trips and the vehicle must be in the MAP and coolant range.

POSSIBLE CAUSES

VSS CONNECTOR 5-VOLT SUPPLY CIRCUIT OPEN
VSS SPEEDOMETER PINION GEAR DEFECTIVE
VEHICLE SPEED SENSOR GROUND CIRCUIT OPEN
VEHICLE SPEED SENSOR SIGNAL CIRCUIT OPEN
VEHICLE SPEED SENSOR SIGNAL WIRING HARNESS OBSERVABLE DEFECT
VSS GND CIRCUIT SHORTED TO GROUND
VSS SIGNAL CIRCUIT SHORTED TO GROUND
PCM DEFECTIVE (NO VEHICLE SPEED SENSOR SIGNAL)
VEHICLE SPEED SENSOR DEFECTIVE
VSS ADAPTER NOT POSITIONED AND SEATED PROPERLY
INACTIVE TROUBLE CODE

DRIVEABILITY

P-0500 NO VEHICLE SPEED SENSOR SIGNAL — Continued

TEST	ACTION	APPLICABILITY
356	<p>Raise the drive wheels off the ground. Warning: Be sure to keep hands and feet clear of rotating wheels. Start engine. With DRB, read the Vehicle Speed Sensor. Put transmission in any forward gear, allow wheels to rotate. Does the DRB show above zero MPH?</p> <p>Yes → Go To 357 No → Go To 358</p>	All
357	<p>Ignition Off Note: At this time the condition required to set the Code is not present. Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Perform following checks to identify possible intermittent problem. Visually inspect related harness connectors for defective terminals. Visually inspect related harnesses for chafed, peirced, or broken wire. Refer to any hotlines or TSB's that may apply. Perform Powertrain Verification Test VER-5A.</p>	All
358	<p>Ignition Off Hoist vehicle, check the VSS Adapter for proper seating and positioning. Was the Adapter positioned and seated properly?</p> <p>Yes → Go To 359 No → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p>	All
359	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Note: Check connectors - Clean/repair as necessary. Key on. Measure the voltage at the 5-Volt Supply Circuit. Is the voltage above 4.0 volts?</p> <p>Yes → Go To 360 No → Repair the open 5-volt Supply Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
360	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Note: Check connectors - Clean/repair as necessary. Connect one end of a jumper wire to the Vss Signal Circuit. With the DRB, read the VSS Signal. While observing display, tap other end of jumper to Sensor Ground Circuit. Does the display show more than 0 MPH?</p> <p>Yes → Go To 361 No → Go To 362</p>	All

P-0500 NO VEHICLE SPEED SENSOR SIGNAL — Continued

TEST	ACTION	APPLICABILITY
361	<p>Ignition Off Remove the Vehicle Speed Sensor. Inspect the Speedometer Pinion Gear. Is the Pinion Gear OK?</p> <p>Yes → Replace the Vehicle Speed Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p>	All
362	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Measure the resistance of the Sensor Ground Circuit from the PCM Connector to the VSS Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 363</p> <p>No → Repair the open Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
363	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Measure the resistance of the Vehicle Speed Sensor Signal Circuit from the PCM Connector to the VSS Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 364</p> <p>No → Repair the open Vehicle Speed Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
364	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Measure resistance between the VSS Signal Circuit and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the VSS Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 365</p>	All
365	<p>Ignition Off Disconnect the Vehicle Speed Sensor (VSS) Connector. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Measure the resistance between the Sensor Ground Circuit and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Sensor Ground Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-0505 IAC #1 MOTOR CIRCUIT

POSSIBLE CAUSES

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND
IAC MOTOR DEFECTIVE
IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN
PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONNECTOR OBSERVABLE DEFECT
IAC #1 DRIVER CIRCUIT SHORTED TO GROUND
IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT
IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4
IAC #2 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT
IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF
IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF
PCM DEF (IAC #2)
PCM DEF (IAC #3)
PCM DEF (IAC #4)
IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN
PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRD
PCM DEF (IAC #1)

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
366	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 367</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
367	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 368</p>	All
368	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 369</p> <p>No → Go To 405</p>	All
369	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 370</p> <p>No → Go To 402</p>	All
370	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 371</p> <p>No → Go To 399</p>	All

DRIVEABILITY

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
371	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 372 No → Go To 396</p>	All
372	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 373 No → Go To 388</p>	All
373	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 374 No → Go To 388</p>	All
374	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 375 No → Go To 378</p>	All
375	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 376</p>	All

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
376	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 377</p>	All
377	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 393</p>	All
378	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 379</p>	All
379	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 380</p>	All
380	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 381</p>	All
381	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 382</p>	All

DRIVEABILITY

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
382	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 383</p>	All
383	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 384</p>	All
384	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 385</p>	All
385	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 386</p>	All

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
386	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 387</p>	All
387	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All
388	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 389</p>	All
389	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 390</p>	All
390	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 391</p>	All

DRIVEABILITY

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
391	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 392</p>	All
392	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 393</p>	All
393	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 394</p>	All
394	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 395</p>	All

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
395	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 405</p>	All
396	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 397</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
397	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 398</p>	All
398	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
399	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 400</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0505 IAC #1 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
400	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 401</p>	All
401	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
402	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 403</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
403	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 404</p>	All
404	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
405	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All

Symptom:**P-0505 IAC #2 MOTOR CIRCUIT****POSSIBLE CAUSES**

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND
IAC MOTOR DEFECTIVE
IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN
PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRD
PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONNECTOR OBSERVABLE DEFECT
IAC #1 DRIVER CIRCUIT SHORTED TO GROUND
IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT
IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4
IAC #2 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT
IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF
IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF
PCM DEF (IAC #1)
PCM DEF (IAC #3)
PCM DEF (IAC #4)
IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN
PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED
PCM DEF (IAC #2)

DRIVEABILITY

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
406	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 407</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
407	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 408</p>	All
408	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 409</p> <p>No → Go To 458</p>	All
409	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 410</p> <p>No → Go To 455</p>	All
410	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 411</p> <p>No → Go To 452</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
411	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 412 No → Go To 432</p>	All
412	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 413 No → Go To 432</p>	All
413	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 414 No → Go To 417</p>	All
414	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 415</p>	All
415	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 416</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
416	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 438</p>	All
417	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 418</p> <p>No → Go To 428</p>	All
418	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 419</p>	All
419	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 420</p>	All
420	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 421</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
421	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 422</p>	All
422	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 423</p>	All
423	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 424</p>	All
424	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 425</p>	All

DRIVEABILITY

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
425	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 426</p>	All
426	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 427</p>	All
427	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All
428	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 429</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
429	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 430</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
430	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 431</p>	All
431	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 444</p>	All
432	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 433</p> <p>No → Go To 441</p>	All
433	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 434</p>	All

DRIVEABILITY

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
434	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 435	All
435	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 436	All
436	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 437	All
437	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 438	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
438	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 439</p>	All
439	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 440</p>	All
440	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 458</p>	All
441	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 442</p>	All

DRIVEABILITY

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
442	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 443</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
443	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 444</p>	All
444	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 445</p>	All
445	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 446</p>	All
446	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 447</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
447	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 448</p>	All
448	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 449</p>	All
449	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 450</p>	All
450	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 451</p>	All

DRIVEABILITY

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
451	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
452	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 453</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
453	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 454</p>	All
454	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
455	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 456</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
456	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 457</p>	All

P-0505 IAC #2 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
457	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All
458	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All

DRIVEABILITY

Symptom:

P-0505 IAC #3 MOTOR CIRCUIT

POSSIBLE CAUSES

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND
IAC MOTOR DEFECTIVE
IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN
PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRD
PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONNECTOR OBSERVABLE DEFECT
IAC #1 DRIVER CIRCUIT SHORTED TO GROUND
IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT
IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4
IAC #2 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT
IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF
IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF
PCM DEF (IAC #1)
PCM DEF (IAC #2)
PCM DEF (IAC #4)
IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN
PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED
PCM DEF (IAC #3)

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
459	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 460</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
460	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 461</p>	All
461	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 462</p> <p>No → Go To 524</p>	All
462	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 463</p> <p>No → Go To 521</p>	All
463	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 464</p> <p>No → Go To 489</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
464	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 465 No → Go To 489</p>	All
465	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 466 No → Go To 469</p>	All
466	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 467</p>	All
467	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 468</p>	All
468	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 496</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
469	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 470 No → Go To 485</p>	All
470	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 471 No → Go To 481</p>	All
471	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 472</p>	All
472	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 473</p>	All
473	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 474</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
474	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 475	All
475	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 476	All
476	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 477	All
477	Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers? Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A. No → Go To 478	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
478	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 479</p>	All
479	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 480</p>	All
480	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All
481	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 482</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
482	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 483</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
483	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 484</p>	All
484	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 502</p>	All
485	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 486</p>	All
486	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 487</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
487	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 488</p>	All
488	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 513</p>	All
489	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 490</p> <p>No → Go To 510</p>	All
490	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 491</p> <p>No → Go To 499</p>	All
491	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 492</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
492	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 493</p>	All
493	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 494</p>	All
494	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 495</p>	All
495	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 496</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
496	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 497</p>	All
497	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 498</p>	All
498	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 524</p>	All
499	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 500</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
500	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 501</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
501	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 502</p>	All
502	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 503</p>	All
503	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 504</p>	All
504	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 505</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
505	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 506</p>	All
506	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 507</p>	All
507	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 508</p>	All
508	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 509</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
509	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
510	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 511</p>	All
511	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 512</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
512	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 513</p>	All
513	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 514</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
514	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 515</p>	All
515	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 516</p>	All
516	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 517</p>	All
517	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 518</p>	All

DRIVEABILITY

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
518	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 519</p>	All
519	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 520</p>	All
520	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
521	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 522</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
522	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 523</p>	All

P-0505 IAC #3 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
523	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All
524	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All

DRIVEABILITY

Symptom:

P-0505 IAC #4 MOTOR CIRCUIT

POSSIBLE CAUSES

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND
IAC MOTOR DEFECTIVE
IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN
PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRED
PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONNECTOR OBSERVABLE DEFECT
IAC #1 DRIVER CIRCUIT SHORTED TO GROUND
IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT
IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4
IAC #2 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT
IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF
IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF
PCM DEF (IAC #1)
PCM DEF (IAC #2)
PCM DEF (IAC #3)
IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN
PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED
PCM DEF (IAC #4)

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
525	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 526</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
526	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 527</p>	All
527	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 528</p> <p>No → Go To 603</p>	All
528	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 529</p> <p>No → Go To 559</p>	All
529	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 530</p> <p>No → Go To 559</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
530	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 531 No → Go To 534</p>	All
531	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 532</p>	All
532	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 533</p>	All
533	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 567</p>	All
534	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 535 No → Go To 555</p>	All
535	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 536 No → Go To 551</p>	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
536	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 537</p> <p>No → Go To 547</p>	All
537	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 538</p>	All
538	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 539</p>	All
539	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 540</p>	All
540	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 541</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
541	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 542</p>	All
542	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 543</p>	All
543	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 544</p>	All
544	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 545</p>	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
545	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 546</p>	All
546	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All
547	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 548</p>	All
548	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 549</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
549	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 550</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
550	Ignition Off Inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 573	All
551	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 552	All
552	Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms? Yes → Go To 553 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.	All
553	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 554	All
554	Ignition Off Inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 584	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
555	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 556</p>	All
556	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 557</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
557	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 558</p>	All
558	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 595</p>	All
559	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 560</p> <p>No → Go To 592</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
560	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 561 No → Go To 581	All
561	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 562 No → Go To 570	All
562	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 563	All
563	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 564	All
564	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 565	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
565	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 566</p>	All
566	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 567</p>	All
567	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 568</p>	All
568	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 569</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
569	Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms? Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A. No → Go To 603	All
570	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 571	All
571	Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms? Yes → Go To 572 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.	All
572	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 573	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
573	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 574</p>	All
574	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 575</p>	All
575	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 576</p>	All
576	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 577</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
577	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 578</p>	All
578	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 579</p>	All
579	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 580</p>	All
580	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
581	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 582</p>	All
582	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 583</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
583	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 584</p>	All
584	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 585</p>	All
585	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 586</p>	All

DRIVEABILITY

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
586	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 587</p>	All
587	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 588</p>	All
588	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 589</p>	All
589	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 590</p>	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
590	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 591</p>	All
591	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
592	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 593</p>	All
593	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 594</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
594	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 595</p>	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
595	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 596	All
596	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 597	All
597	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 598	All
598	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 599	All

P-0505 IAC #4 MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
599	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 600</p>	All
600	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 601</p>	All
601	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 602</p>	All
602	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
603	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT

When Monitored and Set Condition:

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT

When Monitored: At key on and battery voltage greater than 11.5 volts.

Set Condition: The PCM senses a short to ground or battery voltage on any of the four IAC driver circuits for 2.75 seconds while the IAC motor is active.

POSSIBLE CAUSES

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND
IAC MOTOR DEFECTIVE
IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN
IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN
PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRD
PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED
PCM CONNECTOR OBSERVABLE DEFECT
IAC #1 DRIVER CIRCUIT SHORTED TO GROUND
IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT
IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4
IAC #2 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CIRCUIT SHORTED TO GROUND
IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT
IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF
IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF
PCM DEF (IAC #1)
PCM DEF (IAC #2)
PCM DEF (IAC #3)
PCM DEF (IAC #4)

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
604	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 605 No → Go To 633</p>	All
605	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 606 No → Go To 633</p>	All
606	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 607 No → Go To 609</p>	All
607	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 608</p>	All
608	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.</p>	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
609	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 610</p>	All
610	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 611</p> <p>No → Go To 630</p>	All
611	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 612</p>	All
612	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 613</p> <p>No → Go To 627</p>	All
613	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 614</p> <p>No → Go To 624</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
614	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 615</p>	All
615	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 616</p> <p>No → Go To 621</p>	All
616	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 617</p>	All
617	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 618</p>	All
618	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 619</p>	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
619	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 620</p>	All
620	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 644</p>	All
621	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 622</p>	All
622	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 623</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
623	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 650	All
624	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 625	All
625	Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms? Yes → Go To 626 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.	All
626	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 656	All
627	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 628	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
628	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 629</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
629	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 663</p>	All
630	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 631</p>	All
631	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 632</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
632	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 669</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
633	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 634 No → Go To 666</p>	All
634	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 635 No → Go To 659</p>	All
635	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 636 No → Go To 652</p>	All
636	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 637</p>	All
637	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 638 No → Go To 646</p>	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
638	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 639</p>	All
639	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 640</p>	All
640	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 641</p>	All
641	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 642</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
642	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 643</p>	All
643	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 644</p>	All
644	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 645</p>	All
645	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
646	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 647</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
647	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 648</p>	All
648	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 649</p>	All
649	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 650</p>	All
650	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 651</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
651	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All
652	<p>Ignition Off</p> <p>Disconnect IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect Powertrain Control Module Connector (Black).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure between IAC Driver #1 and ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 653</p>	All
653	<p>Ignition Off</p> <p>Disconnect the IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the PCM Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 654</p> <p>No → Repair the open IAC Motor Driver Control Circuit.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All
654	<p>Ignition Off</p> <p>Disconnect the PCM Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 655</p>	All
655	<p>Ignition Off</p> <p>Disconnect IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect Powertrain Control Module Connector (Black).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure between IAC Driver #4 and ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 656</p>	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
656	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 657</p>	All
657	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 658</p>	All
658	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
659	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 660</p>	All
660	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 661</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
661	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 662	All
662	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 663	All
663	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 664	All
664	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 665	All
665	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-5A.	All

DRIVEABILITY

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
666	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 667</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
667	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 668</p>	All
668	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 669</p>	All
669	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 670</p>	All
670	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 671</p>	All

P-0505 IDLE AIR CONTROL MOTOR CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
671	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 672</p>	All
672	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-0551 POWER STEERING SWITCH FAILURE

When Monitored and Set Condition:

P-0551 POWER STEERING SWITCH FAILURE

When Monitored: With the ignition key on and engine running.

Set Condition: With the vehicle above 40 mph for over 30 seconds, the power steering pressure switch remains open.

POSSIBLE CAUSES
POWER STEERING PRESSURE SWITCH DEFECTIVE
POWER STEERING PRESSURE SWITCH GROUND CIRCUIT OPEN
P/S PRESSURE SWITCH CIRCUIT SHORT TO GROUND
P/S SWITCH WIRING HARNESS INTERMITTENT DEFECT
P/S SWITCH WIRING HARNESS OBSERVABLE DEFECT
POWER STEERING PRESSURE SWITCH CIRCUIT OPEN
POWERTRAIN CONTROL MODULE DEFECTIVE

P-0551 POWER STEERING SWITCH FAILURE — Continued

TEST	ACTION	APPLICABILITY
673	<p>Engine Running With the DRB, monitor the P/S Switch. Turn Steering Wheel to both extremes. Did the Power Steering Pressure Switch change state?</p> <p>Yes → Go To 674 No → Go To 676</p>	All
674	<p>Engine Running With the DRB, monitor the PS Switch state. While monitoring the PS Switch State, wiggle the Harness. Did the Power Steering Switch change state?</p> <p>Yes → Repair the Harness as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 675</p>	All
675	<p>Ignition Off Using the Schematic, inspect the Wiring and Harnesses. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.</p>	All
676	<p>Ignition Off Disconnect the Power Steering Pressure Switch. Note: Check connectors - Clean/repair as necessary. Connect a jumper wire to the Power Steering Pressure Switch Circuit. Key on. With the DRB, monitor the Power Steering Pressure Switch. Touch the other end of jumper to ground 5 times. Did the Power Steering Pressure Switch change states?</p> <p>Yes → Go To 677 No → Go To 679</p>	All
677	<p>Ignition Off Disconnect the Power Steering Pressure Switch. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Ground Ckt at PS Pressure Switch Conn. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 678 No → Repair the open Ground Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
678	<p>If there are no potential causes remaining, the Power Steering Pressure Switch is assumed to be defective. View repair options.</p> <p>Repair Replace the Power Steering Pressure Switch. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

P-0551 POWER STEERING SWITCH FAILURE — Continued

TEST	ACTION	APPLICABILITY
679	Ignition Off Disconnect the Power Steering Pressure Switch. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the P/S Pressure Switch Ckt at the P/S Sw to ground. Was the resistance below 5.0 ohms? Yes → Repair the Power Steering Pressure Switch Circuit for a short to ground. Perform Powertrain Verification Test VER-5A. No → Go To 680	All
680	Ignition Off Disconnect the Power Steering Pressure Switch. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the P/S Pressure Sw Ckt from the PCM to the Conn. Was the resistance below 5.0 ohms? Yes → Go To 681 No → Repair the open Power Steering Pressure Switch Circuit. Perform Powertrain Verification Test VER-5A.	All
681	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.	All

Symptom:**P-0600 PCM FAILURE SPI COMMUNICATIONS****When Monitored and Set Condition:****P-0600 PCM FAILURE SPI COMMUNICATIONS**

When Monitored: With the ignition key on.

Set Condition: Internal Bus communications failure between processors.

POSSIBLE CAUSES

PCM FAILURE SPI COMMUNICATIONS

DRIVEABILITY

P-0600 PCM FAILURE SPI COMMUNICATIONS — Continued

TEST	ACTION	APPLICABILITY
682	Ignition On, Engine Not Running. With the DRB, read Trouble Codes. Is Trouble Code PCM FAILURE SPI COMMUNICATION present? Yes → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A No → Test Complete.	All

Symptom:**P-0601 INTERNAL CONTROLLER FAILURE****When Monitored and Set Condition:****P-0601 INTERNAL CONTROLLER FAILURE**

When Monitored: With the ignition key on.

Set Condition: Internal checksum for software failed, does not match calculated value.

POSSIBLE CAUSES**INTERNAL CONTROLLER FAILURE**

DRIVEABILITY

P-0601 INTERNAL CONTROLLER FAILURE — Continued

TEST	ACTION	APPLICABILITY
683	Ignition On, Engine Not Running. With the DRB, read Trouble Codes. Is Trouble Code INTERNAL CONTROLLER FAILURE present? Yes → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A No → Test Complete.	All

Symptom:**P-0645 A/C CLUTCH RELAY CIRCUIT****When Monitored and Set Condition:****P-0645 A/C CLUTCH RELAY CIRCUIT**

When Monitored: With the ignition key in the run position and battery voltage above 10.4 volts.

Set Condition: An open or shorted condition is detected in the A/C clutch relay control circuit.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

A/C CLUTCH RELAY DEF

A/C CLUTCH RELAY CONTROL CIRCUIT OPEN

A/C CLUTCH RELAY CONTROL CIRCUIT SHORT TO GROUND

A/C CLUTCH RLY CKT WIRING HARN INTERMITTENT DEF

A/C CLUTCH RLY CKT WIRING HARN OBSERVABLE DEF

PCM DEF (A/C CLUTCH RELAY)

DRIVEABILITY

P-0645 A/C CLUTCH RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
684	<p>Ignition On, Engine Not Running With the DRB, actuate the A/C Clutch Relay. Is the A/C Clutch Relay clicking?</p> <p>Yes → Go To 685</p> <p>No → Go To 688</p>	All
685	<p>Ignition On, Engine Not Running With the DRB, actuate the A/C Clutch Relay. Wiggle the Wiring Harness from the Relay to the Powertrain Control Module. Did the wiggling interrupt the clicking?</p> <p>Yes → Repair as necessary where wiggling caused the clicking to be interrupted. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 686</p>	All
686	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 687</p>	All
687	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All
688	<p>Ignition Off Disconnect the A/C Clutch Relay. Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. Using a Voltmeter, measure the Fused Ignition Switch Output Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 689</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A.</p>	All

P-0645 A/C CLUTCH RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
689	<p>Ignition Off</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between Terminals 85 and 86 of the A/C Clutch Relay.</p> <p>Is the resistance below 100.0 ohms?</p> <p>Yes → Go To 690</p> <p>No → Replace the A/C Clutch Relay.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
690	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Grey Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the A/C Clutch Relay Control Circuit from the Relay to the PCM.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 691</p> <p>No → Repair open A/C Clutch Relay Control Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
691	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Grey Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the A/C Clutch Control Circuit at PCM to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the A/C Clutch Relay Control Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 692</p>	All
692	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

P-1195 SLOW 1/1 O2S DURING CATALYST MONITOR

When Monitored and Set Condition:

P-1195 SLOW 1/1 O2S DURING CATALYST MONITOR

When Monitored: With the engine running, coolant greater than 170 degrees F, open throttle, steady to slightly increasing vehicle speed > 18 MPH < 55 MPH, with a light load on the engine, for a period no less than five minutes.

Set Condition: The oxygen sensor signal voltage is switching from below 0.39 volt to above 0.6 volt and back fewer times than required.

POSSIBLE CAUSES

1/1 OXYGEN SENSOR CONNECTOR OBSERVABLE DEFECT
1/1 OXYGEN SENSOR DEFECTIVE
1/1 OXYGEN SENSOR GROUND CIRCUIT OPEN
ENGINE FLUID CONSUMPTION
EXHAUST SYSTEM LEAKING
PCM CONNECTOR OBSERVABLE DEFECT

P-1195 SLOW 1/1 O2S DURING CATALYST MONITOR — Continued

TEST	ACTION	APPLICABILITY
693	<p>Start the engine. Note: Check the exhaust for excessive smoke caused by oil or coolant consumption. Is there an oil or coolant consumption condition present?</p> <p>Yes → Repair engine mechanical as necessary, and replace the 1/1 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 694</p>	All
694	<p>Ignition Off Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Inspect the Connectors and Terminals. Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 695</p>	All
695	<p>Start the engine. Check the Exhaust System for leaks between the engine and the catalyst. Is there any exhaust leak?</p> <p>Yes → Repair or replace leaking Exhaust parts as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 696</p>	All
696	<p>Ignition Off Disconnect the 1/1 O2 Sensor. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the 1/1 O2 Sensor Ground Circuit from the 1/1 O2 Sensor Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 697</p> <p>No → Repair the open 1/1 O2 Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
697	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Inspect the Connectors and Terminals. Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Replace the 1/1 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-1197 SLOW 1/2 O2S DURING CATALYST MONITOR

POSSIBLE CAUSES
1/2 OXYGEN SENSOR CONNECTOR OBSERVABLE DEFECT
1/2 OXYGEN SENSOR DEFECTIVE
1/2 OXYGEN SENSOR GROUND CIRCUIT OPEN
ENGINE FLUID CONSUMPTION
EXHAUST SYSTEM LEAKING
PCM CONNECTOR OBSERVABLE DEFECT

P-1197 SLOW 1/2 O2S DURING CATALYST MONITOR — Continued

TEST	ACTION	APPLICABILITY
698	<p>Engine Running</p> <p>Note: Check the exhaust for excessive smoke caused by oil or coolant consumption.</p> <p>Is there an oil or coolant consumption condition present?</p> <p>Yes → Repair engine mechanical as necessary, and replace the 1/2 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 699</p>	All
699	<p>Engine Running</p> <p>Check the Exhaust System for leaks between the engine and the catalyst.</p> <p>Is there any exhaust leak?</p> <p>Yes → Repair or replace leaking Exhaust parts as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 700</p>	All
700	<p>Ignition Off</p> <p>Disconnect the 1/2 O2 Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect the Connectors and Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair or replace as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 701</p>	All
701	<p>Ignition Off</p> <p>Disconnect the 1/2 O2 Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the 1/2 O2 Sensor Ground Circuit from the 1/2 O2 Sensor Connector to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 702</p> <p>No → Repair the open 1/2 O2 Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
702	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect the Connectors and Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Replace the 1/2 O2 Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-1281 ENGINE IS COLD TOO LONG

When Monitored and Set Condition:

P-1281 ENGINE IS COLD TOO LONG

When Monitored: The ignition key on, engine running.

Set Condition: Engine does not warm to 176 degrees Fahrenheit while driving for 20 minutes after start.

POSSIBLE CAUSES
ENGINE COLD TOO LONG

P-1281 ENGINE IS COLD TOO LONG — Continued

TEST	ACTION	APPLICABILITY
703	Start Engine Drive vehicle under normal driving conditions for 20 minutes. With the DRB, read Engine Coolant Temperature. Did the engine warm to 176 degrees F? Yes → Test Complete. No → See pertinent service manual information for cooling system diagnostics.	All

DRIVEABILITY

Symptom:

P-1282 FUEL PUMP RELAY CONTROL CIRCUIT

When Monitored and Set Condition:

P-1282 FUEL PUMP RELAY CONTROL CIRCUIT

When Monitored: With the ignition key on and battery voltage greater than 10.4 volts.

Set Condition: An open or shorted condition is detected in the fuel pump relay control circuit.

POSSIBLE CAUSES

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

FUEL PUMP RELAY RESISTANCE ABOVE 100.0 OHMS

FUEL PUMP RELAY CONTROL CIRCUIT OPEN

FUEL PUMP RELAY CONTROL CIRCUIT SHORT TO GROUND

FUEL PUMP RELAY WIRING HARNESS INTERMITTENT DEFECT

FUEL PUMP RELAY WIRING HARNESS OBSERVABLE DEFECT

PCM DEFECTIVE

P-1282 FUEL PUMP RELAY CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
704	<p>Ignition On, Engine Not Running With the DRB, actuate the Fuel Pump Relay. Is the Fuel Pump Relay clicking?</p> <p>Yes → Go To 705</p> <p>No → Go To 707</p>	All
705	<p>Ignition On, Engine Not Running With the DRB, actuate the Fuel Pump Relay. Wiggle the Wiring Harness from the Relay to the PCM. Did the Relay clicking stop or become irregular when wiggling the wires?</p> <p>Yes → Repair Circuit as necessary where wiggling caused clicking to stop or become irregular. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 706</p>	All
706	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Test Complete.</p>	All
707	<p>Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running. Using a Voltmeter, measure the Fused Ignition Switch Output Circuit at Relay. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 708</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
708	<p>Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between Terminals 85 and 86 of the Fuel System Relay. Is the resistance below 100.0 ohms?</p> <p>Yes → Go To 709</p> <p>No → Replace the Fuel Pump Relay. Perform Powertrain Verification Test VER-2A.</p>	All

P-1282 FUEL PUMP RELAY CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
709	Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Fuel Pump Relay Control Circuit from the PCM to the Relay. Is the resistance below 5.0 ohms? Yes → Go To 710 No → Repair open Fuel Pump Relay Control Circuit. Perform Powertrain Verification Test VER-2A.	All
710	Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Fuel Pump Relay Control Circuit at PCM to ground. Is the resistance below 5.0 ohms? Yes → Repair the Fuel Pump Relay Control Circuit for a short to ground. Perform Powertrain Verification Test VER-2A. No → Go To 711	All
711	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace the PCM. Perform Powertrain Verification Test VER-2A.	All

Symptom:**P-1294 TARGET IDLE NOT REACHED****When Monitored and Set Condition:****P-1294 TARGET IDLE NOT REACHED**

When Monitored: With the engine idling and in Drive if automatic. There must not be a MAP sensor trouble code or a throttle position sensor trouble code.

Set Condition: Engine idle is not within 200 rpm above or 100 rpm below target idle for 14 seconds. Three separate failures are required to set a bad trip. Two bad trips are required to set code.

POSSIBLE CAUSES

ENGINE, BRAKE BOOSTER, OR VACUUM HOSES DEF

IAC WIRING HARNESS INTERMITTENT DEFECT

IAC WIRING HARNESS OBSERVABLE DEF

THROTTLE BODY DEF (ENGINE RPM < 550)

THROTTLE BODY DEF (ENGINE RPM >= 550)

THROTTLE PLATE & LINKAGE NOT IN CORRECT POSITIONS

DRIVEABILITY

P-1294 TARGET IDLE NOT REACHED — Continued

TEST	ACTION	APPLICABILITY
712	<p>Start engine, allow to idle for 60 seconds. If this is an Automatic Transmission, put in drive.</p> <p>Is the engine RPM within +200 or -100 RPM of target idle?</p> <p>Yes → Go To 713</p> <p>No → Go To 717</p>	All
713	<p>Ignition Off</p> <p>With the DRB in system tests, perform the IAC wiggle test.</p> <p>Note: The idle speed should raise and lower with the display.</p> <p>Does the idle raise and lower with the display?</p> <p>Yes → Go To 714</p> <p>No → Refer to symptom P-0505 IDLE AIR CONTROL MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All
714	<p>Ignition Off</p> <p>Inspect the Wiring and Connectors.</p> <p>Were any problems found?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 715</p>	All
715	<p>Engine Running</p> <p>With the DRB in system tests, wiggle the Wiring Harness from the IAC Motor to the PCM.</p> <p>Monitor the engine RPM.</p> <p>Did the IAC stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 716</p>	All
716	<p>Ignition On, Engine Not Running</p> <p>Check Throttle Plate and Linkage for a binding condition.</p> <p>Note: The Throttle Linkage must be at the idle position.</p> <p>Ensure the Throttle Plate is fully closed and against its stop.</p> <p>Is the Throttle Plate and Linkage OK?</p> <p>Yes → Test Complete.</p> <p>No → Repair as necessary.</p>	All
717	<p>Ignition Off</p> <p>Start engine, allow to idle for 60 seconds.</p> <p>With the DRB in system tests, perform the IAC wiggle test.</p> <p>Note: The idle speed should raise and lower with the display.</p> <p>Does the idle raise and lower with the display?</p> <p>Yes → Go To 718</p> <p>No → Refer to symptom P-0505 IDLE AIR CONTROL MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All

P-1294 TARGET IDLE NOT REACHED — Continued

TEST	ACTION	APPLICABILITY
718	<p>Engine Running</p> <p>Note: For this test to be valid the engine must not have any Vacuum leaks.</p> <p>Check Engine, Brake Booster, and Vacuum Hoses for leaks.</p> <p>Ensure PCV Valve is the correct one and is operating correctly.</p> <p>Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 719</p>	All
719	<p>Ignition On, Engine Not Running</p> <p>Check Throttle Plate and Linkage for a binding condition.</p> <p>Note: The Throttle Linkage must be at the idle position.</p> <p>Ensure the Throttle Plate is fully closed and against its stop.</p> <p>Is the Throttle Plate and Linkage OK?</p> <p>Yes → Go To 720</p> <p>No → Repair as necessary.</p>	All
720	<p>Ignition Off</p> <p>Disconnect the PCV Valve Hose from the Intake Manifold and Cap Port at Intake Manifold.</p> <p>Disconnect the Idle Purge Hose from the Throttle Body.</p> <p>Install Miller Tool #6714 to the Purge Hose Port of the Throttle Body.</p> <p>Start engine. Allow engine to reach operating temperature (above 180 degrees).</p> <p>With the DRB, actuate the Minimum Air Flow.</p> <p>Is the engine RPM below 550?</p> <p>Yes → Go To 721</p> <p>No → Replace the Throttle Body. Perform Powertrain Verification Test VER-5A.</p>	All
721	<p>Ignition Off</p> <p>See pertinent service information for removal of Throttle Body.</p> <p>Warning: Clean the Throttle Body in a well ventilated area and wear rubber gloves.</p> <p>While holding the Throttle open, spray entire Throttle Body Bore with Mopar Parts Cleaner.</p> <p>Using a soft scuff pad, clean the Throttle Body Bore and Throttle Plate.</p> <p>Using compressed air, dry the Throttle Body and install Throttle Body on Manifold.</p> <p>Start engine and let idle.</p> <p>With the DRB, actuate the Minimum Air Flow.</p> <p>Is the engine RPM below 550?</p> <p>Yes → Replace the Throttle Body. Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

P-1297 NO CHANGE IN MAP FROM START TO RUN

When Monitored and Set Condition:

P-1297 NO CHANGE IN MAP FROM START TO RUN

When Monitored: With engine rpm above 400 but less than 1500 and the throttle body at closed throttle.

Set Condition: Too small a difference is seen between barometric pressure at ignition on and manifold vacuum (engine running) for 1.72 seconds.

POSSIBLE CAUSES
MAP SENSOR 5-VOLT SUPPLY CIRCUIT OPEN
MAP SENSOR WIRING HARNESS INTERMITTENT DEFECT
VACUUM PORTS RESTRICTED OR DEF
MAP SENSOR RESTRICTED
MAP SENSOR DEF (NO PRESS CHANGE)
MAP SENSOR DEF (PRESS CHANGE)

P-1297 NO CHANGE IN MAP FROM START TO RUN — Continued

TEST	ACTION	APPLICABILITY
722	<p>Ignition On, Engine Not Running With the DRB, read Codes. Is the DTC Specific Good Trip displayed and equal to 0?</p> <p>Yes → Refer to symptom P-0107 MAP SENSOR VOLTAGE TOO LOW in the DRIVEABILITY category.</p> <p>No → Go To 723</p>	All
723	<p>Ignition On, Engine Not Running With the DRB, erase codes. Start engine and allow engine to idle for 30 seconds. With the DRB, read the codes. Does the DRB show "No change in MAP from start to run"?</p> <p>Yes → Go To 724</p> <p>No → Go To 727</p>	All
724	<p>Disconnect MAP Sensor Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure voltage of the 5-Volt Supply Circuit at MAP Connector. Is the voltage above 4.5 volts?</p> <p>Yes → Go To 725</p> <p>No → Repair the open MAP Sensor 5-Volt Supply Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
725	<p>Ignition On, Engine off. Remove the MAP Sensor and inspect condition of Vacuum Port. Inspect condition of Intake Manifold or Throttle Body Vacuum Port. Was there a restriction?</p> <p>Yes → Remove the restriction and reinstall the MAP Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 726</p>	All
726	<p>If there are no potential causes remaining, the MAP Sensor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the MAP Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
727	<p>Engine Running While monitoring the DRB display, snap the Throttle open and closed. Did the Vacuum drop rapidly below 1.0"?</p> <p>Yes → Go To 728</p> <p>No → Go To 729</p>	All

DRIVEABILITY

P-1297 NO CHANGE IN MAP FROM START TO RUN — Continued

TEST	ACTION	APPLICABILITY
728	<p>Engine Running</p> <p>With the DRB, set the engine speed to 1500 RPM.</p> <p>With the engine RPM at 1500, read MAP Sensor voltage.</p> <p>While monitoring the voltage, wiggle the Wiring from the MAP Sensor to PCM.</p> <p>Did the engine stall or voltage become erratic?</p> <p>Yes → Repair the Wiring or Connector defect between the MAP Sensor and the PCM.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All
729	<p>Engine Running</p> <p>With the DRB, set the engine speed to 1500 RPM.</p> <p>With the engine RPM at 1500, read MAP Sensor voltage.</p> <p>While monitoring the voltage, wiggle the Wiring from the MAP Sensor to PCM.</p> <p>Did the engine stall or voltage become erratic?</p> <p>Yes → Repair the Wiring or Connector defect between the MAP Sensor and the PCM.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 730</p>	All
730	<p>Ignition Off</p> <p>Remove the MAP Sensor and inspect condition of Vacuum Port.</p> <p>Inspect condition of Intake Manifold or Throttle Body Vacuum Port.</p> <p>Is there a restriction or defect in the Vacuum Ports?</p> <p>Yes → Repair the restricted or defective Vacuum Ports.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 731</p>	All
731	<p>If there are no potential causes remaining, the MAP Sensor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the MAP Sensor.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All

Symptom:**P-1388 AUTO SHUTDOWN RELAY CONTROL CIRCUIT****When Monitored and Set Condition:****P-1388 AUTO SHUTDOWN RELAY CONTROL CIRCUIT**

When Monitored: With ignition key on and battery voltage greater than 10.4 volts.

Set Condition:

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING

FUSED IGNITION OUTPUT CIRCUIT OPEN

WIRING AND CONNECTORS OBSERVABLY DEFECTIVE

WIRING HARNESS INTERMITTENTLY DEFECTIVE

AUTO SHUTDOWN RELAY DEFECTIVE

ASD RELAY CONTROL CIRCUIT SHORT TO GROUND

AUTO SHUTDOWN RELAY CONTROL CIRCUIT OPEN

POWERTRAIN CONTROL MODULE DEFECTIVE (ASD RLY CTRL CKT)

P-1388 AUTO SHUTDOWN RELAY CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
732	<p>Ignition On, Engine Not Running With the DRB, actuate the Auto Shutdown Relay. Is the Auto Shutdown Relay clicking?</p> <p>Yes → Go To 733</p> <p>No → Go To 736</p>	All
733	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 734</p>	All
734	<p>Start Engine Wiggle the Wiring Harness from the Relay to the Powertrain Control Module. Did the engine die out when wiggling wires?</p> <p>Yes → Repair Circuit as necessary where wiggling caused the Engine to die out. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 735</p>	All
735	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All
736	<p>Ignition Off Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Turn key on. Using a Voltmeter, measure the Fused Ignition Switch Output Circuit at Relay. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 737</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
737	<p>Ignition Off Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between Terminals 85 and 86 of the ASD Relay. Is the resistance below 100.0 ohms?</p> <p>Yes → Go To 738</p> <p>No → Replace Auto Shutdown Relay. Perform Powertrain Verification Test VER-2A.</p>	All

P-1388 AUTO SHUTDOWN RELAY CONTROL CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
738	<p>Ignition Off Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the ASD Relay Control Circuit at PCM to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Auto Shutdown Relay Control Circuit for a short to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 739</p>	All
739	<p>Ignition Off Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the ASD Relay Control Circuit from the Relay to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 740</p> <p>No → Repair open Auto Shutdown Relay Control Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
740	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

P-1389 NO ASD RELAY OUTPUT VOLTAGE AT PCM

When Monitored and Set Condition:

P-1389 NO ASD RELAY OUTPUT VOLTAGE AT PCM

When Monitored: With the ignition key on, battery voltage greater than 10.4 volts and RPM greater than 40.

Set Condition: No voltage sensed at the powertrain control module when the auto shutdown relay is energized.

POSSIBLE CAUSES

FUSED B(+) CIRCUIT OPEN

AUTO SHUTDOWN RELAY DEFECTIVE

ASD RELAY OUTPUT CIRCUIT OPEN (ENGINE STARTED)

ASD RELAY OUTPUT CKT OPEN (ENGINE DID NOT START)

ASD RELAY OUTPUT CKT WIRING HARNESS OBSERVABLE DEF

ASD RLY OUTPUT CKT WIRING HARNESS INTERMITTENT DEF

PCM DEF (ENGINE DID NOT START)

PCM DEF (ENGINE STARTED)

P-1389 NO ASD RELAY OUTPUT VOLTAGE AT PCM — Continued

TEST	ACTION	APPLICABILITY
741	<p>Ignition On, Engine Not Running With the DRB, read Codes. Is the DTC Specific Good Trip displayed and equal to 0?</p> <p>Yes → Refer to symptom P-1388 AUTO SHUTDOWN RELAY CONTROL CIRCUIT in the DRIVEABILITY category.</p> <p>No → Go To 742</p>	All
742	<p>Ignition On, Engine Not Running With the DRB, erase codes. Start engine, allow engine to idle for at least 10 seconds. Read codes. Does the DRB show "No ASD Relay Output voltage at PCM" with a start/run count of zero?</p> <p>Yes → Go To 743</p> <p>No → Go To 750</p>	All
743	<p>Ignition Off Attempt to start the vehicle. Did the engine start?</p> <p>Yes → Go To 744</p> <p>No → Go To 746</p>	All
744	<p>Ignition Off Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the ASD Relay. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the ASD Relay Output Circuit from the Relay to the PCM. Is the resistance above 5.0 ohms?</p> <p>Yes → Repair open ASD Relay Output Circuit. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 745</p>	All
745	<p>If there are no potential causes remaining, the PCM (engine started) is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-2A.</p>	All
746	<p>Ignition Off Disconnect the ASD Relay. Note: Check connectors - Clean/repair as necessary. Ignition on. Using a Voltmeter, measure the Fused B(+) Circuit voltage. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 747</p> <p>No → Repair the open Fused B(+) Circuit. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

P-1389 NO ASD RELAY OUTPUT VOLTAGE AT PCM — Continued

TEST	ACTION	APPLICABILITY
747	<p>Ignition Off Disconnect the ASD Relay. Note: Check connectors - Clean/repair as necessary. Install a substitute Relay for the ASD Relay. Attempt to start the vehicle. Did the engine start?</p> <p>Yes → Replace the original ASD Relay. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 748</p>	All
748	<p>Ignition Off Disconnect the ASD Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Using a Ohmmeter, measure the resistance of the ASD Relay Output Circuit from ASD Relay to the PCM. Is the resistance above 5.0 ohms?</p> <p>Yes → Repair open ASD Relay Output Circuit. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 749</p>	All
749	<p>If there are no potential causes remaining, the PCM (Engine did not start) is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-2A.</p>	All
750	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 751</p>	All
751	<p>Start engine and let idle. Wiggle the Wiring Harness from ASD Relay to the PCM. Read fault codes. Did the wiggling cause the fault code to appear?</p> <p>Yes → Repair as necessary where wiggling caused the trouble code to be set. Perform Powertrain Verification Test VER-2A.</p> <p>No → Test Complete.</p>	All

Symptom:**P-1391 INTERMITTENT LOSS OF CMP OR CKP****When Monitored and Set Condition:****P-1391 INTERMITTENT LOSS OF CMP OR CKP**

When Monitored: Engine running or cranking.

Set Condition: When the failure counter reaches 96 for 2 consecutive trips.

POSSIBLE CAUSES

CKP CONNECTOR OBSERVABLY DEFECTIVE
CKP SENSOR CONNECTOR TERMINAL(S) OBSERVABLE DEF
CKP SENSOR SIGNAL CKT WIR HARNESS INTERMITTENT DEF
CMP & CKP WIRING HARNESS INTERMITTENT DEFECT
CMP CONNECTOR OBSERVABLY DEFECTIVE
CMP SENSOR CONNECTOR TERMINAL(S) OBSERVABLY DEF
CMP SENSOR SIGNAL CKT WIRING HARNESS INTER DEF
PCM BLACK CONN OBSERVABLE DEFECT
FLYWHEEL DEFECTIVE
ROTOR OR ROTOR DRIVE SYSTEM LOOSE
CAMSHAFT POSITION SENSOR DEFECTIVE
CRANKSHAFT POSITION DEFECTIVE
PCM CONNECTOR TERMINAL(S) OBSER DEF (CKP SENSOR)
PCM CONNECTOR TERMINAL(S) OBSER DEF (CMP SENSOR)

P-1391 INTERMITTENT LOSS OF CMP OR CKP — Continued

TEST	ACTION	APPLICABILITY
752	<p>Ignition Off</p> <p>Note: CMP or CKP Sensor Signal loss can be detected by an RPM change, trouble code or pattern on the Oscilloscope.</p> <p>Do you want to diagnose CMP or CKP Sensor Signal loss with an Oscilloscope?</p> <p>Yes → Go To 753</p> <p>No → Go To 766</p>	All
753	<p>Ignition Off</p> <p>At the CMP Sensor, backprobe the CMP Sensor Signal Circuit with the voltage lead. Start the engine and observe the CMP Sensor voltage pattern on the Oscilloscope. Are there any CMP Sensor Signals missing?</p> <p>Yes → Go To 754</p> <p>No → Go To 758</p>	All
754	<p>Ignition Off</p> <p>Disconnect the CMP Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect all Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 755</p>	All
755	<p>Ignition Off</p> <p>Disconnect the PCM Black Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect all Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 756</p>	All
756	<p>Ignition Off</p> <p>Remove the Distributor Cap.</p> <p>Inspect the Rotor and Rotor Drive System for looseness per service information. Is the Rotor and Rotor Drive System OK?</p> <p>Yes → Go To 757</p> <p>No → Repair the loose Distributor Rotor or Rotor Drive System as necessary. Perform Powertrain Verification Test VER-5A.</p>	All
757	<p>If there are no potential causes remaining, the Camshaft Position Sensor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Camshaft Position Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

P-1391 INTERMITTENT LOSS OF CMP OR CKP — Continued

TEST	ACTION	APPLICABILITY
758	<p>Ignition Off</p> <p>At the CKP Sensor, backprobe the CKP Sensor Signal Circuit with the Oscilloscope's voltage measurement lead.</p> <p>Start the engine and observe the CKP Sensor voltage pattern on the Oscilloscope. Are any CKP Sensor signals missing?</p> <p>Yes → Go To 759</p> <p>No → Go To 764</p>	All
759	<p>Ignition Off.</p> <p>At PCM backprobe CMP Sensor Signal Circuit with Scope's voltage measurement lead.</p> <p>While observing the Oscilloscope pattern, wiggle the CMP Sensor Circuit from the Sensor to PCM.</p> <p>Were any CMP Signals missing when the wiggle test was conducted?</p> <p>Yes → Note where wiggling the Wires caused a missing CMP Sensor signal. Repair Camshaft and Crankshaft Wire Harness as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 760</p>	All
760	<p>Ignition Off</p> <p>Disconnect the CKP Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect all Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 761</p>	All
761	<p>Ignition Off</p> <p>Disconnect the PCM Black Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect all Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 762</p>	All
762	<p>Ignition Off</p> <p>Remove the Crankshaft Position Sensor.</p> <p>Inspect the Flywheel for damage.</p> <p>Is the Flywheel damaged?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 763</p>	All
763	<p>If there are no potential causes remaining, the Crankshaft Position Sensor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Crankshaft Position Sensor.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All

P-1391 INTERMITTENT LOSS OF CMP OR CKP — Continued

TEST	ACTION	APPLICABILITY
764	<p>Ignition Off.</p> <p>At PCM backprobe CMP Sensor Signal Circuit with Scope's voltage measurement lead.</p> <p>While observing the Oscilloscope pattern, wiggle the CMP Sensor Circuit from the Sensor to PCM.</p> <p>Were any CMP Signals missing when the wiggle test was conducted?</p> <p>Yes → Note where wiggling the Wires caused a missing CMP Sensor signal. Repair Camshaft and Crankshaft Wire Harness as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 765</p>	All
765	<p>At PCM, backprobe CKP Sensor Signal Circuit with Scope's voltage measurement lead.</p> <p>Start the Engine.</p> <p>While observing the Oscilloscope pattern, wiggle CKP Sensor Circuit from Sensor to PCM.</p> <p>Were any CKP Sensor Signals missing when the wiggle test was conducted?</p> <p>Yes → Note where wiggling the wires caused a missing CKP Sensor Signal. Repair the Camshaft and Crankshaft Wire Harness as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Test Complete.</p>	All
766	<p>Start the engine and let it idle.</p> <p>With the DRB, monitor the RPM while wiggling CMP & CKP Harness Wiring.</p> <p>Does the engine speed change when wiggling the Wire Harness?</p> <p>Yes → Note where wiggling wires caused an engine speed change and repair Wire Harness as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 767</p>	All
767	<p>Ignition Off</p> <p>Disconnect the CKP Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect all Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 768</p>	All
768	<p>Ignition Off</p> <p>Disconnect the CMP Sensor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect the Terminals.</p> <p>Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 769</p>	All

P-1391 INTERMITTENT LOSS OF CMP OR CKP — Continued

TEST	ACTION	APPLICABILITY
769	Ignition Off Disconnect the PCM Black Connector. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Is any Terminal corroded, damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All

DRIVEABILITY

Symptom:

P-1398 MIS-FIRE ADAPTIVE NUMERATOR AT LIMIT

When Monitored and Set Condition:

P-1398 MIS-FIRE ADAPTIVE NUMERATOR AT LIMIT

When Monitored: Under closed throttle decel. with A/C off, engine coolant temp above 75 degrees, and more than 50 seconds after engine start. Speed at which decel. occurs must be sufficient for given gear range, eg, above 36 mph in 1st gear or above 65 mph in high gear.

Set Condition: One of the crankshaft position sensor target windows has more than 2.86% variance from the reference window.

POSSIBLE CAUSES
CRANKSHAFT POSITION SENSOR DEFECTIVE
CRANKSHAFT POSITION SENSOR NOT PROPERLY INSTALLED
CRANKSHAFT POSITION CONNECTOR OBSERVABLE DEFECT
FLEXPLATE DAMAGED

P-1398 MIS-FIRE ADAPTIVE NUMERATOR AT LIMIT — Continued

TEST	ACTION	APPLICABILITY
770	<p>Ignition Off Inspect the Crankshaft Position Sensor for proper installation. Is the Crankshaft Position Sensor properly installed?</p> <p>Yes → Go To 771</p> <p>No → Properly install Crankshaft Position Sensor. Perform Powertrain Verification Test VER-5A.</p>	All
771	<p>Ignition Off Disconnect the Crankshaft Position Connector. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 772</p>	All
772	<p>Ignition Off Remove the Crankshaft Position Sensor. Inspect the slots in the Flexplate for damage or excessive movement. Is there any damage or excessive movement?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 773</p>	All
773	<p>If there are no potential causes remaining, the Crankshaft Position Sensor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Crankshaft Position Sensor. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom:

P-1486 EVAP LEAK MONITOR PINCHED HOSE FOUND

When Monitored and Set Condition:

P-1486 EVAP LEAK MONITOR PINCHED HOSE FOUND

When Monitored: After cold start, amb temp 40-90deg/cool temp w/in 10deg. If PCM suspect pinch hose, no fault until run evap purge flow mon. If no pass, fault set. Purge flow mon'd w/eng temp>170deg, closed loop, idling 2min, no lo fuel, MAP<15.7in merc, baro alt<8000 ft

Set Condition: LDP must pass stricter evap system test first. No air flow through the evaporative system is detected by the evap monitor.

POSSIBLE CAUSES
FUEL TANK TO EVAP CANISTER HOSE PINCHED
LDP PRESSURE HOSE BLOCKAGE
PURGE SOLENOID TO EVAP CANISTER HOSE PINCHED
LEAK DETECTION PUMP BLOCKAGE
EVAPORATIVE CANISTER BLOCKAGE LDP SIDE
EVAPORATIVE CANISTER BLOCKAGE SOLENOID SIDE
EVAP LEAK MONITOR PINCHED HOSE DOES NOT REOCCUR

P-1486 EVAP LEAK MONITOR PINCHED HOSE FOUND — Continued

TEST	ACTION	APPLICABILITY
774	<p>NOTE: Replacing the Powertrain Control Module will not correct this problem.</p> <p>With the DRB, read the DTCs.</p> <p>Is the DTC SPECIFIC GOOD TRIP counter displayed and equal to zero?</p> <p>Yes → Go To 776</p> <p>No → Go To 775</p>	All
775	<p>At this time the Evap Leak Monitor Pinched Hose Found does not exist or is an intermittent problem.</p> <p>With the DRB, read the FREEZE FRAME.</p> <p>With this screen, attempt to duplicate the condition that has set this fault.</p> <p>While using FREEZE FRAME pay particular attention to the fault setting conditions, such as speed, temp, load, and map vacuum.</p> <p>Does the Evap Leak Monitor Pinched Hose Found reoccur?</p> <p>Yes → Go To 776</p> <p>No → Evap Leak Monitor Pinched Hose Found no longer exists. Perform VERIFICATION TEST VER-6A.</p>	All
776	<p>To perform this test you will need Miller Tool Kit #6872A and #6922.</p> <p>Caution: Refer to safety information.</p> <p>Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover.</p> <p>Connect the Evap Pressure Pump Supply to Gas Cap Adapter and install on vehicle.</p> <p>Start Engine.</p> <p>With the DRB, go to LDP SYSTEM TEST and follow instructions on the screen.</p> <p>Using Pressure Tool #6872A, set Pressure Hold to Open, and set Vent to Closed.</p> <p>Turn Pump Timer On.</p> <p>Allow Pressure Pump to build pressure up to at least 14" H2O.</p> <p>Remove Vacuum Connector from Purge Solenoid.</p> <p>Did the pressure drop when the Vacuum Connector was removed?</p> <p>Yes → Go To 777</p> <p>No → Go To 779</p>	All
777	<p>To perform this test you will need Miller Tool Kit #6872A and #6922.</p> <p>Caution: Refer to safety information.</p> <p>Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover.</p> <p>Connect the Evap Pressure Pump Supply to Gas Cap Adapter and install on vehicle.</p> <p>Start Engine.</p> <p>With the DRB, go to LDP SYSTEM TEST and follow instructions on the screen.</p> <p>Using Pressure Tool #6872A, set Pressure Hold to Open, and set Vent to Closed.</p> <p>Turn Pump Timer On.</p> <p>Allow Pressure Pump to build pressure up to at least 14" H2O.</p> <p>Disconnect Leak Detection Pump Pressure Hose from LDP.</p> <p>Did pressure drop when hose was disconnected?</p> <p>Yes → Replace the Leak Detection Pump. Perform VERIFICATION TEST VER-6A.</p> <p>No → Go To 778</p>	All

DRIVEABILITY

P-1486 EVAP LEAK MONITOR PINCHED HOSE FOUND — Continued

TEST	ACTION	APPLICABILITY
778	<p>Inspect the LDP Pressure Hose. Is the hose OK?</p> <p>Yes → Replace the Evaporative Canister. Perform VERIFICATION TEST VER-6A.</p> <p>No → Replace the LDP Pressure Hose. Perform VERIFICATION TEST VER-6A.</p>	All
779	<p>To perform this test you will need Miller Tool Kit #6872A and #6922. Caution: Refer to safety information. If disconnected, reconnect the Vacuum Connector at the Purge Solenoid. Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover. Connect the Evap Pressure Pump Supply to Gas Cap Adapter and install on vehicle. Start Engine. With the DRB, go to LDP SYSTEM TEST and follow instructions on the screen. Using Pressure Tool #6872A, set Pressure Hold to Open, and set Vent to Closed. Turn Pump Timer On. Allow Pressure Pump to build pressure up to at least 14" H2O. Remove hose at Evap Canister that goes to Purge Solenoid. Did pressure drop when hose was disconnected?</p> <p>Yes → Repair the pinched hose from the Purge Solenoid to the Evap Canister. Perform VERIFICATION TEST VER-6A.</p> <p>No → Go To 780</p>	All
780	<p>To perform this test you will need Miller Tool Kit #6872A and #6922. Caution: Refer to safety information. Perform Evaporative System Pressure Pump Self Test that is specified on the tester cover. Connect the Evap Pressure Pump Supply to Gas Cap Adapter and install on vehicle. Start Engine. With the DRB, go to LDP SYSTEM TEST and follow instructions on the screen. Using Pressure Tool #6872A, set Pressure Hold to Open, and set Vent to Closed. Turn Pump Timer On. Allow Pressure Pump to build pressure up to at least 14" H2O. Remove hose at Evap Canister that goes to Fuel Tank. Did pressure drop when hose was disconnected?</p> <p>Yes → Replace the Evaporative Canister. Perform VERIFICATION TEST VER-6A.</p> <p>No → Repair the pinched hose from the Gas Tank to the Evap Canister. Perform VERIFICATION TEST VER-6A.</p>	All

Symptom:**P-1491 RAD FAN CONTROL RELAY CIRCUIT****When Monitored and Set Condition:****P-1491 RAD FAN CONTROL RELAY CIRCUIT**

When Monitored: With the ignition key on and battery voltage greater than 10.4 volts.

Set Condition: An open or shorted condition is detected in the radiator fan relay control circuit.

POSSIBLE CAUSES

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

RADIATOR FAN CONTROL RELAY DEFECTIVE

RAD FAN RLY CNTRL CKT SHORT TO GROUND

RADIATOR FAN CNTRL RLY CKT WIR HARN INTER DEF

RADIATOR FAN CNTRL RLY CKT WRG HARN OBS DEF

RADIATOR FAN RELAY CONTROL CIRCUIT OPEN

PCM DEFECTIVE

P-1491 RAD FAN CONTROL RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
781	Ignition On, Engine Not Running With the DRB, actuate the Radiator Fan Relay. Is the Radiator Fan Relay clicking? Yes → Go To 782 No → Go To 784	All
782	Ignition On, Engine Not Running With the DRB, actuate the Radiator Fan Relay. Wiggle the Wiring Harness from the Relay to the PCM. Did the wiggling interrupt the clicking? Yes → Repair as necessary where wiggling caused the clicking to be interrupted. Perform Powertrain Verification Test VER-5A. No → Go To 783	All
783	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Test Complete.	All
784	Ignition Off Disconnect the Radiator Fan Relay. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the Fused Ignition Switch Relay Output Circuit voltage. Is the voltage above 10.0 volts? Yes → Go To 785 No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-5A.	All
785	Ignition Off Disconnect the Radiator Fan Relay. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between Terminals 85 and 86 of the Radiator Fan Relay. Is the resistance below 100.0 ohms? Yes → Go To 786 No → Replace the Radiator Fan Relay. Perform Powertrain Verification Test VER-5A.	All

P-1491 RAD FAN CONTROL RELAY CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
786	<p>Ignition Off Disconnect the Radiator Fan Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Radiator Fan Relay Control Circuit at PCM to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Radiator Fan Relay Control Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 787</p>	All
787	<p>Ignition Off Disconnect the Radiator Fan Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Grey Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Radiator Fan Relay Control Circuit from the Relay to the PCM. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 788</p> <p>No → Repair the open Radiator Fan Relay Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
788	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All

DRIVEABILITY

Symptom List:

P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH

P-1493 BATTERY TEMP SENSOR VOLTAGE TOO LOW

Test Note: All symptoms listed above are diagnosed using the same tests.
The title for the tests will be **P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH**.

When Monitored and Set Condition:

P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH

When Monitored: With the ignition key on.

Set Condition: The PCM senses the voltage from the BTS to be either below 0.5 volts or above 4.9 volts for 3 seconds.

P-1493 BATTERY TEMP SENSOR VOLTAGE TOO LOW

When Monitored: With the ignition key on.

Set Condition: The PCM senses the voltage from the BTS to be either below 0.5 volts or above 4.9 volts for 3 seconds.

POSSIBLE CAUSES

NO POSSIBLE CAUSES REMAINING
BATTERY TEMPERATURE SENSOR GROUND CIRCUIT OPEN
BATTERY TEMPERATURE SENSOR DEFECTIVE
BTS DEF (VOLTAGE TOO HIGH)
BATTERY TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN
BTS CONNECTOR AND HARNESS INTERMITTENT DEF
BTS CONNECTOR AND HARNESS OBSERVABLY DEF
BTS SIGNAL CIRCUIT SHORT TO GROUND
BTS SIGNAL CIRCUIT SHORT TO SENSOR GROUND
BTS SIGNAL CIRCUIT SHORTED TO VOLTAGE
PCM DEF (BTS VOLTAGE LOW)
PCM DEFECTIVE (BTS VTGE TOO LOW/ VOLTAGE TOO HIGH)

P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
789	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Battery Temperature Sensor (BTS) voltage.</p> <p>Is the Battery Temperature Sensor voltage below 0.4 volt?</p> <p>Yes → Go To 790</p> <p>No → Go To 794</p>	All
790	<p>Ignition Off</p> <p>Disconnect the Battery Temperature Sensor (BTS).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Ignition on, engine not running.</p> <p>With the DRB, read the Battery Temp Sensor voltage.</p> <p>Is the Battery Temperature Sensor voltage above 4.0 volts?</p> <p>Yes → Replace the Battery Temperature Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 791</p>	All
791	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Battery Temperature Sensor (BTS).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the BTS Signal Circuit to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the BTS Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 792</p>	All
792	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Battery Temperature Sensor (BTS).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the BTS Signal Circuit and Sensor Ground Circuit at BTS Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Sensor Signal shorted to Sensor ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 793</p>	All
793	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-5A.</p>	All
794	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the Battery Temperature Sensor (BTS) voltage.</p> <p>Is the Battery Temperature voltage above 4.9 volts?</p> <p>Yes → Go To 795</p> <p>No → Go To 800</p>	All

DRIVEABILITY

P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
795	<p>Ignition Off Disconnect the Battery Temperature Sensor (BTS). Note: Check connectors - Clean/repair as necessary. Connect a jumper wire across the Sensor Signal to a good ground. Ignition on, engine not running. With the DRB, read the BTS voltage. Is the voltage below 1.0 volt?</p> <p>Yes → Repair the open Sensor Ground Circuit. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 796</p>	All
796	<p>Ignition Off Disconnect the Battery Temperature Sensor (BTS). Note: Check connectors - Clean/repair as necessary. Connect a jumper wire across the Sensor Signal and the Sensor Ground Circuit. Ignition on, engine not running. With the DRB, read the Battery Temp Sensor voltage. Is the Battery Temperature voltage below 1.0 volt?</p> <p>Yes → Replace the Battery Temperature Sensor. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 797</p>	All
797	<p>Ignition Off Disconnect the Battery Temperature Sensor (BTS). Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. Using a Voltmeter measure the BTS Signal Circuit at BTS Connector. Is the voltage above 6.0 volts?</p> <p>Yes → Repair BTS Signal Circuit for a short to voltage. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 798</p>	All
798	<p>Ignition Off Disconnect the Battery Temperature Sensor (BTS). Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the BTS Signal Circuit from PCM to BTS Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 799</p> <p>No → Repair the open Battery Temp Sensor Signal Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
799	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All

P-1492 BATTERY TEMP SENSOR VOLTAGE TOO HIGH — Continued

TEST	ACTION	APPLICABILITY
800	<p>Ignition On, Engine Not Running Use the schematic as a guide and wiggle the BTS Connector and Harness. Monitor the DRB display. Was there any Battery Temp Sensor voltage change?</p> <p>Yes → Repair the Connector or Harness that caused the voltage change. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 801</p>	All
801	<p>Ignition Off At this time, the condition required to set the code is not present. Using the schematic as a guide, inspect the Connectors and Harness Wiring. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 802</p>	All
802	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

DRIVEABILITY

Symptom:

P-1494 LEAK DETECTION PUMP SWITCH OR MECHANICAL FAULT

When Monitored and Set Condition:

P-1494 LEAK DETECTION PUMP SWITCH OR MECHANICAL FAULT

When Monitored: Immediately after a cold start, with ambient temperature between 40 degrees F and 90 degrees F and coolant temperature within 10 degrees F of ambient temperature.

Set Condition: The state of the switch does not change when the solenoid is energized.

POSSIBLE CAUSES

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

LDP PRESSURE SWITCH CIRCUIT SHORTED TO GROUND

LDP SWITCH SENSE CIRCUIT OPEN

LEAK DETECTION PUMP DEFECTIVE

LDP WIRING HARNESS INTERMITTENT DEFECT

LDP WIRING HARNESS OBSERVABLE DEFECT

POWERTRAIN CONTROL MODULE DEFECTIVE

VACUUM HOSE DEFECTIVE

P-1494 LEAK DETECTION PUMP SWITCH OR MECHANICAL FAULT —
Continued

TEST	ACTION	APPLICABILITY
803	<p>Start engine and let idle. Put DRB in LDP System Test. Observe LDP Switch state. While still in System Test, press switch test. With the DRB, read the LDP Pump Switch state. Did the LDP Switch State toggle?</p> <p>Yes → Go To 804 No → Go To 806</p>	All
804	<p>Engine Running Let engine idle. While monitoring the LDP Switch state, wiggle Wiring Harness from the LDP Solenoid to PCM. Did the LDP Switch state ever stop toggling when the Wiring was wiggled?</p> <p>Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-6A. No → Go To 805</p>	All
805	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-6A. No → Test Complete.</p>	All
806	<p>Ignition Off Disconnect the Leak Detection Pump Connector. Note: Check connectors - Clean/repair as necessary. Key on. Measure the Fused Ignition Switch Output Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 807 No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-6A.</p>	All
807	<p>Ignition Off Disconnect the Leak Detection Pump Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter measure the resistance of the LDP Pressure Switch Circuit from the PCM Connector to a good ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair LDP Pressure Switch Circuit for a short to ground. Perform Powertrain Verification Test VER-6A. No → Go To 808</p>	All

DRIVEABILITY

P-1494 LEAK DETECTION PUMP SWITCH OR MECHANICAL FAULT — Continued

TEST	ACTION	APPLICABILITY
808	Ignition Off Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Key on. With Voltmeter connected to LDP Pressure Switch Circuit at PCM Connector. Ground the LDP Solenoid Control Circuit then while applying vacuum to LDP with a hand Vacuum Pump, observe voltmeter. Did voltage change? Yes → Go To 809 No → Replace the Leak Detection Pump. Perform Powertrain Verification Test VER-6A.	All
809	Ignition Off Disconnect the Engine Vacuum Supply Hose at the Leak Detection Pump. Install a Vacuum gauge to Engine Vacuum Supply Hose at the Leak Detection Pump. Start engine and read Vacuum Gauge. Does Vacuum Gauge read within 1 inch of engine vacuum? Yes → Go To 810 No → Repair the leak or obstruction in Vacuum Hose. Perform Powertrain Verification Test VER-6A.	All
810	Ignition Off Disconnect the Leak Detection Pump Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter measure the resistance of the LDP Pressure Switch Sense Circuit from the PCM Connector to LDP Connector. Is the resistance below 5.0 ohms? Yes → Go To 811 No → Repair open Leak Detection Pump Switch Sense Circuit. Perform Powertrain Verification Test VER-6A.	All
811	If there are no potential causes remaining, the PCM is assumed to be defective. View repair options. Repair Replace PCM. Perform Powertrain Verification Test VER-6A.	All

Symptom:**P-1495 LEAK DETECTION PUMP SOLENOID CIRCUIT****When Monitored and Set Condition:****P-1495 LEAK DETECTION PUMP SOLENOID CIRCUIT**

When Monitored: Ignition on and battery voltage greater than 10.4 volts.

Set Condition: The state of the solenoid circuit does not change.

POSSIBLE CAUSES

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

LEAK DETECTION PUMP DEFECTIVE

LDP SOLENOID CIRCUIT WIRING HARNESS OBSERVABLE DEF

LDP SOLENOID CKT WIRING HARNESS INTERMITTENT DEF

LDP SOLENOID CONTROL CIRCUIT SHORT TO GROUND

LEAK DETECTION PUMP SOLENOID CONTROL CIRCUIT OPEN

POWERTRAIN CONTROL MODULE DEFECTIVE

DRIVEABILITY

P-1495 LEAK DETECTION PUMP SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
812	Ignition On, Engine Not Running With the DRB, actuate the LDP Solenoid. Is it clicking? Yes → Go To 813 No → Go To 815	All
813	Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-6A. No → Go To 814	All
814	Ignition On, Engine Not Running With the DRB, actuate the LDP Solenoid. While wiggling the LDP Wiring Harness from the LDP Solenoid to PCM, listen to LDP Sol. Did the LDP Solenoid ever stop or start clicking? Yes → Repair as necessary where wiggling caused problem to appear. Perform Powertrain Verification Test VER-6A. No → Test Complete.	All
815	Ignition Off Disconnect the Leak Detection Pump Solenoid. Note: Check connectors - Clean/repair as necessary. Key on. Using a Voltmeter, measure the voltage of the Fused Ignition Switch Output Circuit at the Solenoid Connector. Is the voltage above 10.0 volts? Yes → Go To 816 No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-6A.	All
816	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Key on. With the Voltmeter, measure the voltage of the LDP Solenoid Control Circuit at the PCM Connector. Is the voltage above 10.0 volts? Yes → Go To 817 No → Replace the Leak Detection Pump. Perform Powertrain Verification Test VER-6A.	All

P-1495 LEAK DETECTION PUMP SOLENOID CIRCUIT — Continued

TEST	ACTION	APPLICABILITY
817	<p>Ignition Off Disconnect the Leak Detection Pump Solenoid. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Leak Detection Pump Solenoid Control Circuit at the PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Leak Detection Pump Solenoid Control Circuit for a short to ground. Perform Powertrain Verification Test VER-6A.</p> <p>No → Go To 818</p>	All
818	<p>Ignition Off Disconnect the Leak Detection Pump Solenoid. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the resistance of the LDP Solenoid Control Circuit from the PCM Connector to the LDP Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 819</p> <p>No → Repair the open Leak Detection Pump Solenoid Control Circuit. Perform Powertrain Verification Test VER-6A.</p>	All
819	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-6A.</p>	All

DRIVEABILITY

Symptom:

P-1696 PCM FAILURE EEPROM WRITE DENIED

When Monitored and Set Condition:

P-1696 PCM FAILURE EEPROM WRITE DENIED

When Monitored: With the Ignition Key on.

Set Condition: An attempt to program/write to the internal EEPROM failed.

POSSIBLE CAUSES
PCM DEFECTIVE "WRITE REFUSED"

P-1696 PCM FAILURE EEPROM WRITE DENIED — Continued

TEST	ACTION	APPLICABILITY
820	Ignition On, Engine Not Running With the DRB, perform the SRI memory test. Does the DRB display "Write Refused"? Yes → Go To 821 No → Go To 821	All
821	Ignition On, Engine Not Running With the DRB, perform the SRI memory test a second time. Does the DRB display "Write Refused"? Yes → Replace the PCM. No → Test Complete.	All

DRIVEABILITY

Symptom:

P-1698 NO CCD MESSAGES FROM TCM

When Monitored and Set Condition:

P-1698 NO CCD MESSAGES FROM TCM

When Monitored: With the engine running.

Set Condition: No CCD messages are received from the TCM for 10 seconds.

POSSIBLE CAUSES
DRB DOES NOT SHOW BUS OPERATIONAL
NO POSSIBLE CAUSES REMAINING
CCD BUS (+) CIRCUIT OPEN
CCD BUS (-) CIRCUIT OPEN
POWERTRAIN CONTROL MODULE DEFECTIVE
TRANSMISSION CONTROL MODULE DEFECTIVE
WIRING HARNESS OBSERVABLE DEFECT

P-1698 NO CCD MESSAGES FROM TCM — Continued

TEST	ACTION	APPLICABILITY
822	<p>Turn ignition on. With the DRB, select Transmission. Note: The CCD Bus Test is automatic. Does the DRB show Bus Operational?</p> <p>Yes → Go To 823</p> <p>No → Refer to Communication Symptom Test for any Bus Error Messages.</p>	All
823	<p>Turn ignition on. With the DRB, select Engine Module. Raise all four wheels off the ground and properly support the vehicle. Caution: Keep clear of rotating wheels in the next step. Start the engine. Place the shift lever in drive and allow the wheels to rotate for 1 minute. Step on the brakes, put the shift lever back in park. With the DRB, read trouble codes. Does the display show No CCD Message From TCM and the start run counter equal to zero?</p> <p>Yes → Go To 824</p> <p>No → Go To 828</p>	All
824	<p>Turn Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the TCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the CCD Bus (+) Circuit between the PCM and TCM Connectors. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 825</p> <p>No → Repair the open CCD Bus (+) Circuit between PCM and TCM. Perform Powertrain Verification Test VER-2A.</p>	All
825	<p>Turn Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the TCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the CCD Bus (-) circuit between the PCM and TCM Connectors. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 826</p> <p>No → Repair the open CCD Bus (-) Circuit between the PCM and TCM. Perform Powertrain Verification Test VER-2A.</p>	All
826	<p>Key On Using the DRB, select Transmission. Does the DRB display show No Response?</p> <p>Yes → Replace the Transmission Control Module. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 827</p>	All

DRIVEABILITY

P-1698 NO CCD MESSAGES FROM TCM — Continued

TEST	ACTION	APPLICABILITY
827	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p>	All
828	<p>Ignition Off At this time, the condition required to set the Trouble Code is not present. Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 829</p>	All
829	<p>Visually inspect related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals. Visually inspect the related harnesses. Look for chafed, pierced, or partially broken wire. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All

Symptom:*** CHECKING COOLANT SENSOR CALIBRATION****POSSIBLE CAUSES**

TEMPERATURE FAILED TO REACH AT LEAST 180F OR ABOVE

TEMPERATURE INCREASE NOT SMOOTH

DRIVEABILITY

* CHECKING COOLANT SENSOR CALIBRATION — Continued

TEST	ACTION	APPLICABILITY
830	<p>Ignition On, Engine Not Running With the DRB, read the ECT Sensor value. Note: If vehicle temperature is above 180F, allow engine to cool until 150F is reached. Start engine. While monitoring the DRB, allow engine to reach normal operating temperature (above 180F). Did the coolant temperature reach 180F or above?</p> <p>Yes → Go To 831</p> <p>No → Replace Coolant Sen-Note: Inspect for mech cooling prblms before replacing Sen. Perform Powertrain Verification Test VER-2A.</p>	All
831	<p>Ignition On, Engine Not Running With the DRB, read the ECT Sensor value. Note: If vehicle temperature is above 180F, allow engine to cool until 150F is reached. Start engine. While monitoring the DRB, allow engine to reach normal operating temperature (above 180F). Was the coolant temperature value increase a smooth transition?</p> <p>Yes → Test Complete.</p> <p>No → Replace Coolant Sen-Note: Inspect for mech cooling prblms before replacing Sen. Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:*** CHECKING FOR OXYGEN SENSOR SWITCHING****POSSIBLE CAUSES**

O2 SENSOR SIGNAL CIRCUIT SHORTED TO GROUND

INJECTOR DEFECTIVE

O2 SENSOR DEFECTIVE

AIR INLET SYSTEM RESTRICTED

ENGINE VACUUM ABNORMAL

DRIVEABILITY

* CHECKING FOR OXYGEN SENSOR SWITCHING — Continued

TEST	ACTION	APPLICABILITY
832	<p>Ignition Off</p> <p>Note: The engine must be running and at normal operating temperature.</p> <p>Note: The Downstream O2 Sensor should Switch slower than the Upstream O2 Sensor.</p> <p>With the DRB, read the 1/1 and 1/2 O2 Sensor states.</p> <p>Are the 1/1 and 1/2 O2 Sensor states switching normally?</p> <p>Yes → Test Complete.</p> <p>No → Go To 833</p>	All
833	<p>Engine Running</p> <p>Note: Engine must be running and at normal operating temperature.</p> <p>Note: The Downstream O2 Sensor should switch slower than the Upstream O2 Sensor.</p> <p>With the DRB, read the 1/1 and 1/2 O2 Sensor states.</p> <p>Is the 1/1 O2 Sensor locked "Lean"?</p> <p>Yes → Go To 834</p> <p>No → Go To 840</p>	All
834	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read the 1/1 and 1/2 O2 Sensor voltages.</p> <p>Is the voltage below 0.10 volts for 1/1 or 1/2 O2 Sensors?</p> <p>Yes → Go To 835</p> <p>No → Go To 838</p>	All
835	<p>Engine Running</p> <p>Allow engine to idle.</p> <p>Inspect the engine for any abnormal vacuum conditions.</p> <p>Are there any abnormal vacuum conditions?</p> <p>Yes → Repair abnormal Engine Vacuum condition as required. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 836</p>	All
836	<p>Ignition Off</p> <p>Disconnect the 1/1 or 1/2 O2 Sensor Connector that the voltage is below 0.10 volt.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the O2 Sensor Signal Circuit and a good ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Oxygen Sensor Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 837</p>	All
837	<p>If there are no potential causes remaining, the O2 Sensor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the 1/1 or 1/2 O2 Sensor that was below 0.10 Volts.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

*** CHECKING FOR OXYGEN SENSOR SWITCHING — Continued**

TEST	ACTION	APPLICABILITY
838	<p>Engine Running Allow engine to idle. Inspect the engine for any abnormal vacuum conditions. Are there any abnormal vacuum conditions?</p> <p>Yes → Repair abnormal Engine Vacuum condition as required. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 839</p>	All
839	<p>Ignition On, Engine Not Running With the DRB in miscellaneous, reset the Adaptive Fuel Memory. Start the engine and let it idle for at least three minutes. Note: Engine must be running and at normal operating temperature. Note: The 1/2 O2 Sensor should switch slower than the 1/1 O2 Sensor. With the DRB, read the O2 Sensor voltages. Are the O2 Sensor voltages switching normally?</p> <p>Yes → Test Complete.</p> <p>No → Refer to symptom * CHECKING THE ENGINE MECHANICAL SYSTEMS in the DRIVEABILITY category.</p>	All
840	<p>Ignition Off Install a Fuel Pressure Gauge to the Fuel Line. Use special tools if necessary. Turn Ignition on, with engine not running. With the DRB, actuate the ASD Fuel System Test. Allow Fuel Pressure to stabilize. With the DRB, stop the Fuel System Test. Monitor the Pressure Gauge for 1 minute. Is the Fuel Pressure below 10 psi?</p> <p>Yes → If Fuel Pump and Lines are OK, replace leaking Injector(s) as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 841</p>	All
841	<p>Ignition Off Inspect the Air Filter and Inlet Ducts for restriction(s). Were there any restrictions?</p> <p>Yes → Repair or replace the Air Inlet System as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Refer to symptom * CHECKING THE ENGINE MECHANICAL SYSTEMS in the DRIVEABILITY category.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING MAP SENSOR CALIBRATION**

POSSIBLE CAUSES
MAP SENSOR DEFECTIVE

*** CHECKING MAP SENSOR CALIBRATION — Continued**

TEST	ACTION	APPLICABILITY
842	<p>Ignition Off Tee-in a Vacuum Gauge to a Manifold Vacuum source. Start the engine. Allow the engine to idle. Note: If engine will not idle, maintain a constant RPM above idle. Using the DRB, read the MAP Sensor Vacuum. Is the reading within 1" of the Vacuum Gauge?</p> <p>Yes → Test Complete.</p> <p>No → Replace the MAP Sensor. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING SECONDARY IGNITION AND TIMING**

POSSIBLE CAUSES
ELECTRONIC IGNITION COIL DEFECTIVE
IGNITION CABLES DEFECTIVE
SECONDARY IGNITION SYSTEM DEFECTIVE

* CHECKING SECONDARY IGNITION AND TIMING — Continued

TEST	ACTION	APPLICABILITY
843	<p>Ignition Off</p> <p>Connect a suitable Engine Analyzer to the engine.</p> <p>Start engine and allow the engine to idle.</p> <p>Note: If engine will not idle, maintain a constant RPM above idle.</p> <p>Note: Set the Scope to read display or parade pattern.</p> <p>Follow the equipment manufacturer's procedure for pattern analysis.</p> <p>Note: Do not spray Inductive Pickup.</p> <p>With a spray bottle spray Ignition Cables with water and monitor ignition pattern.</p> <p>Did ignition pattern change?</p> <p>Yes → Repair the indicated component in the Secondary Ignition System.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 844</p>	All
844	<p>Ignition Off</p> <p>Connect a suitable Engine Analyzer to the engine.</p> <p>Start engine and allow the engine to idle.</p> <p>Note: If engine will not idle, maintain a constant RPM above idle.</p> <p>Note: Set the Scope to read display or parade pattern.</p> <p>Follow the equipment manufacturer's procedure for pattern analysis.</p> <p>Is the Secondary Ignition pattern OK?</p> <p>Yes → Go To 845</p> <p>No → Repair the indicated component in the Secondary Ignition System.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
845	<p>Ignition Off</p> <p>Connect a suitable Engine Analyzer to the engine.</p> <p>Start engine and allow the engine to idle.</p> <p>Note: If the engine will not idle, maintain a constant RPM above idle.</p> <p>Note: Set the scope to read display or parade pattern.</p> <p>Follow the equipment manufacturer's procedure for pattern analysis.</p> <p>Momentarily remove and reinstall Spark Plug Wires.</p> <p>While disconnecting each Wire, observe the Secondary KV line.</p> <p>Is the open circuit secondary voltage at least 25 KV?</p> <p>Yes → Test Complete.</p> <p>No → Replace the Ignition Coil.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING THE A/C SYSTEM**

POSSIBLE CAUSES
NO POSSIBLE CAUSES REMAINING
A/C REQUEST CIRCUIT OPEN
A/C SELECT CIRCUIT OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
REFRIGERATION SYSTEM NOT PROPERLY CHARGED
A/C CLUTCH RELAY DEF
HIGH PRESS CUT-OFF SWITCH DEFECTIVE
LOW PRESSURE CYCLING SWITCH DEFECTIVE
A/C CLUTCH RELAY CONTROL CIRCUIT OPEN
A/C CLUTCH RELAY CONTROL CIRCUIT SHORT TO GROUND
A/C CLUTCH RLY CKT WIRING HARN INTERMITTENT DEF
A/C CLUTCH RLY CKT WIRING HARN OBSERVABLE DEF
PCM DEF (A/C CLUTCH RELAY)

*** CHECKING THE A/C SYSTEM — Continued**

TEST	ACTION	APPLICABILITY
846	<p>Ignition On, Engine Not Running Is there an A/C Clutch Relay fault code?</p> <p>Yes → Go To 847</p> <p>No → Go To 856</p>	All
847	<p>Ignition On, Engine Not Running With the DRB, actuate the A/C Clutch Relay. Is the A/C Clutch Relay clicking?</p> <p>Yes → Go To 848</p> <p>No → Go To 851</p>	All
848	<p>Ignition On, Engine Not Running With the DRB, actuate the A/C Clutch Relay. Wiggle the Wiring Harness from the Relay to the Powertrain Control Module. Did the wiggling interrupt the clicking?</p> <p>Yes → Repair as necessary where wiggling caused the clicking to be interrupted. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 849</p>	All
849	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 850</p>	All
850	<p>Use the Freeze Frame Data to help you duplicate the conditions that set the DTC. Pay particular attention to the DTC set conditions, such as VSS, ECT, MAP, and LOAD. If there are no other possible causes remaining there is assumed to be an "intermittent" problem with a Wiring Harness Connector or Wire. View repair options.</p> <p>Repair</p> <p>Visually inspect related Wire Harness Connectors and Harnesses. Look for broken, bent, pushed out, or corroded terminals and for chafed, pierced, or partially broken wire, respectively. Refer to any hotlines or technical service bulletins that apply.</p>	All
851	<p>Ignition Off Disconnect the A/C Clutch Relay. Note: Check connectors - Clean/repair as necessary. Ignition on, engine not running. Using a Voltmeter, measure the Fused Ignition Switch Output Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 852</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

* CHECKING THE A/C SYSTEM — Continued

TEST	ACTION	APPLICABILITY
852	<p>Ignition Off</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between Terminals 85 and 86 of the A/C Clutch Relay.</p> <p>Is the resistance below 100.0 ohms?</p> <p>Yes → Go To 853</p> <p>No → Replace the A/C Clutch Relay.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
853	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Grey Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the A/C Clutch Relay Control Circuit from the Relay to the PCM.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 854</p> <p>No → Repair open A/C Clutch Relay Control Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
854	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module Grey Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the A/C Clutch Relay.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the A/C Clutch Control Circuit at PCM to ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the A/C Clutch Relay Control Circuit for a short to ground.</p> <p>Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 855</p>	All
855	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All
856	<p>Ignition On, Engine Not Running</p> <p>With the DRB, monitor the A/C Select.</p> <p>Turn the A/C Switch on and off a few times.</p> <p>Does the A/C Select state change?</p> <p>Yes → Go To 857</p> <p>No → Repair the open A/C Select Circuit.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

*** CHECKING THE A/C SYSTEM — Continued**

TEST	ACTION	APPLICABILITY
857	<p>Ignition On, Engine Not Running With the DRB, monitor the A/C Request. Turn the A/C System on and the A/C fan on full. Does the A/C Request state change?</p> <p>Yes → Test Complete. No → Go To 858</p>	All
858	<p>Ignition Off Verify the Low Pressure Cycling Switch per appropriate service information. Is the Low Pressure Cycling Switch OK?</p> <p>Yes → Repair the open A/C Request Circuit. Perform Powertrain Verification Test VER-2A. No → Go To 859</p>	All
859	<p>Ignition Off Verify that the Refrigerant System is properly charged per appropriate service information. Is the Refrigerant System properly charged?</p> <p>Yes → Go To 860 No → Properly charge the Refrigerant System per the service manual, section 24. Perform Powertrain Verification Test VER-2A.</p>	All
860	<p>Ignition Off Verify the High Pressure Cut-Off Switch per appropriate service information. Is the High Pressure Cut-Off Switch OK?</p> <p>Yes → Go To 861 No → Replace the faulty High Pressure Cut-Off Switch. Perform Powertrain Verification Test VER-2A.</p>	All
861	<p>If there are no potential causes remaining, the Low Pressure Cycling Switch is assumed to be defective. View repair options.</p> <p>Repair Replace the Faulty Low Pressure Cycling Switch. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING THE BRAKE SWITCH**

POSSIBLE CAUSES
BRAKE SWITCH DEFECTIVE

*** CHECKING THE BRAKE SWITCH — Continued**

TEST	ACTION	APPLICABILITY
862	Ignition On, Engine Not Running With DRB read Brake Switch input while pressing and releasing Brake Switch. Does DRB show pressed and released? Yes → Test Complete. No → Replace Brake Switch. Perform Powertrain Verification Test VER-2A.	All

DRIVEABILITY

Symptom:

*** CHECKING THE ENGINE MECHANICAL SYSTEMS**

POSSIBLE CAUSES
DRIVEABILITY PROBLEM (GAS)

* CHECKING THE ENGINE MECHANICAL SYSTEMS — Continued

TEST	ACTION	APPLICABILITY
863	<p>The Components and Systems that you have checked before this are operating properly. Here are additional non-monitored Components or Systems to check, that could cause a driveability problem.</p> <p>DISTRIBUTOR POSITION - if equipped ensure proper alignment</p> <p>CAMSHAFT LOBES - check for abnormal wear</p> <p>CRANK SENSOR PICK-UP - check crankshaft slots for debris/deterioration</p> <p>ENGINE VACUUM - must be at least 13 inches in neutral</p> <p>ENGINE VALVE TIMING - must be within specifications</p> <p>ENGINE COMPRESSION - must be within specifications</p> <p>ENGINE EXHAUST SYSTEM - must be free of any restrictions</p> <p>ENGINE PCV SYSTEM - must flow freely</p> <p>TORQUE CONVERTER STALL SPEED - must be within specifications</p> <p>POWER BRAKE BOOSTER - no internal vacuum leaks</p> <p>FUEL - must be free of contamination</p> <p>FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector</p> <p>Note: If you came to this test from the oxygen sensor, and the rich or lean condition is not caused by one of the first items above, replace the PCM perform Test VER-2A.</p> <p>Did you come to this test from an Oxygen Sensor rich or lean condition test?</p> <p>Yes → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p> <p>No → Test Complete.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING THE ENGINE VACUUM**

TEST	ACTION	APPLICABILITY
864	<p>Ignition Off</p> <p>Connect a Vacuum Gauge to the engine.</p> <p>Start the engine and allow it to idle.</p> <p>Note: A normal vacuum reading will vary according to the altitude.</p> <p>While monitoring the Vacuum Gauge, snap the Throttle open a few times.</p> <p>Refer to Vacuum Gauge specifications in support material.</p> <p>Observe the Vacuum Gauge reading at idle.</p> <p>Is the Vacuum Gauge reading between 13" and 22" steady at idle?</p> <p>Yes → Test Complete.</p> <p>No → Refer to symptom * CHECKING THE ENGINE MECHANICAL SYSTEMS in the DRIVEABILITY category.</p>	All

Symptom:*** CHECKING THE EVAP SYSTEM (GASOLINE ENGINE)**

POSSIBLE CAUSES
EVAPORATIVE CANISTER DEFECTIVE
PURGE SOLENOID LINE TO CANISTER RESTRICTED
VACUUM HOSES OBSERVABLE DEFECT
EVAP PURGE SOLENOID DEFECTIVE
EVAP PURGE SOLENOID DEFECTIVE(B)
PURGE SOL LINE TO CAN RESTRICTED
PURGE SOLENOID TO CANISTER OBS DEFECTIVE

DRIVEABILITY

* CHECKING THE EVAP SYSTEM (GASOLINE ENGINE) — Continued

TEST	ACTION	APPLICABILITY
865	<p>Ignition Off</p> <p>Note: Carefully inspect all Vacuum Hoses for proper routing and for pinched or plugged hoses from the engine to the EVAP Solenoid to the gas tank.</p> <p>Are all the Vacuum Hoses ok?</p> <p>Yes → Go To 866</p> <p>No → Repair the Vacuum Hoses as necessary. Perform Powertrain Verification Test VER-2A.</p>	All
866	<p>Start the Engine and allow it to reach normal operating temperature (170 Deg F). Turn Engine off (Ignition Off)</p> <p>Disconnect the Purge Vacuum Hose at the Solenoid that goes to the Canister.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Start the engine. There should be no flow through the Solenoid from 1 to 2 minutes. Is the Purge Solenoid allowing vacuum through the Solenoid within 1 minute?</p> <p>Yes → Go To 867</p> <p>No → Go To 870</p>	All
867	<p>Ignition Off</p> <p>Inspect line from the Purge Solenoid to the canister. Is the line disconnected, ripped or cut?</p> <p>Yes → Go To 868</p> <p>No → Clean out the line and replace the EVAP Purge Solenoid and Canister. Perform Powertrain Verification Test VER-2A.</p>	All
868	<p>Ignition Off</p> <p>Inspect line from the Purge Solenoid to the Canister. Is the line disconnected, ripped, or cut?</p> <p>Yes → Repair the line and replace the Purge Solenoid. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 869</p>	All
869	<p>Ignition Off</p> <p>Remove the Purge Solenoid and tap the Ports against a clean, solid surface. Did any foreign material fall out?</p> <p>Yes → Test Complete.</p> <p>No → Replace the EVAP Purge Solenoid. Perform Powertrain Verification Test VER-2A.</p>	All
870	<p>Ignition Off</p> <p>Disconnect the Purge Vacuum Hose at the Solenoid that goes to the Canister.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Note: In the next steps, do not use more than five PSI.</p> <p>Attempt to blow air through the Vacuum Line that goes to the canister. Does the Canister and Vacuum Line allow air to pass?</p> <p>Yes → Go To 873</p> <p>No → Go To 871</p>	All

*** CHECKING THE EVAP SYSTEM (GASOLINE ENGINE) — Continued**

TEST	ACTION	APPLICABILITY
871	<p>Ignition Off</p> <p>Disconnect the Vacuum Line at the Canister that goes to the EVAP Solenoid.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Attempt to blow air through the Vacuum Line that goes to the Canister.</p> <p>Does the Vacuum line allow air to pass?</p> <p>Yes → Replace the Evaporative Canister. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 872</p>	All
872	<p>Ignition Off</p> <p>Disconnect the Vacuum Line at the Canister that goes to the EVAP Solenoid.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Attempt to blow air through the Vacuum Line that goes to the Canister.</p> <p>Does the Vacuum Line allow air to pass?</p> <p>Yes → Go To 873</p> <p>No → Repair or replace the Vacuum Line. Perform Powertrain Verification Test VER-2A.</p>	All
873	<p>Start the Engine and allow it to reach normal operating temperature (170 deg F).</p> <p>Turn Engine off. (Ign. Off)</p> <p>Disconnect the Purge Vacuum Hose at the Solenoid that goes to the Canister.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Note: After 90 seconds, the Purge Solenoid will allow vacuum to cycle intermittently at a steady rate.</p> <p>Is the EVAP Solenoid allowing Vacuum to cycle through intermittently at a steady rate?</p> <p>Yes → Test Complete.</p> <p>No → Replace the Purge Solenoid. Perform Powertrain Verification Test VER-2A.</p>	All

DRIVEABILITY

Symptom:

*** CHECKING THE IDLE AIR CONTROL MOTOR**

POSSIBLE CAUSES
DRB UNABLE TO SET ENGINE SPEED
IAC DRIVER #1 SHORTED TO GROUND
IAC DRIVER #2 SHORTED TO GROUND
IAC DRIVER #3 SHORTED TO GROUND
IAC DRIVER #4 SHORTED TO GROUND
IAC MOTOR CONNECTOR TERMINALS OBSERVABLE DEFECT
PCM CONNECTOR TERMINALS OBSERVABLE DEFECT
ENGINE VACUUM LEAKS
IDLE AIR CONTROL MOTOR DEFECTIVE
IAC DRIVER CIRCUITS 2, 3, 4 SHORTED TOGETHER
IAC DRIVER CIRCUITS 1, 2, 3, 4 SHORTED TOGETHER
IAC DRIVER CIRCUITS 3 AND 4 SHORTED TOGETHER

* CHECKING THE IDLE AIR CONTROL MOTOR — Continued

TEST	ACTION	APPLICABILITY
876	<p>Start engine and let idle to normal operating temperature. Using the DRB in Actuator Tests, set engine speed to 1400 RPM. Is the engine speed 1400 RPM +/- 100 RPM?</p> <p>Yes → With the DRB, stop all tests.</p> <p>No → Go To 877</p>	All
877	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running. With the DRB in Actuator Tests, actuate the IAC Stepper Motor. Note: The voltage may switch or remain constant during this test. Using a Voltmeter, measure the IAC Driver #1 Circuit voltage. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 878</p> <p>No → Refer to symptom P-0505 IAC #1 MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All
878	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 879</p>	All
879	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running. With the DRB in Actuator Tests, actuate the IAC Stepper Motor. Note: The voltage may switch or remain constant during this test. Using a Voltmeter, measure the IAC Driver #2 Circuit voltage. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 880</p> <p>No → Refer to symptom P-0505 IAC #2 MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All
880	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 881</p>	All

DRIVEABILITY

* CHECKING THE IDLE AIR CONTROL MOTOR — Continued

TEST	ACTION	APPLICABILITY
881	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure resistance between the IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 882</p>	All
882	<p>Start engine and let idle to normal operating temperature. Inspect the engine for any Vacuum leak(s). Are there any vacuum leaks?</p> <p>Yes → Repair Vacuum leak(s) as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 883</p>	All
883	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running. With the DRB in Actuator Tests, actuate the IAC Stepper Motor. Note: The voltage may switch or remain constant during this test. With a Voltmeter, measure the IAC Driver #3 Circuit voltage. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 884</p> <p>No → Refer to symptom P-0505 IAC #3 MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All
884	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 885</p>	All
885	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Are any Terminals corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 886</p>	All

*** CHECKING THE IDLE AIR CONTROL MOTOR — Continued**

TEST	ACTION	APPLICABILITY
886	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with engine not running. With the DRB in Actuator Tests, actuate the IAC Stepper Motor. Note: The voltage may switch or remain constant during this test. With a Voltmeter, measure the IAC Driver #4 Circuit voltage. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 887</p> <p>No → Refer to symptom P-0505 IAC #4 MOTOR CIRCUIT in the DRIVEABILITY category.</p>	All
887	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal corroded, damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 888</p>	All
888	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and the #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 889</p>	All
889	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 890</p>	All

DRIVEABILITY

* CHECKING THE IDLE AIR CONTROL MOTOR — Continued

TEST	ACTION	APPLICABILITY
890	<p>Ignition Off</p> <p>Disconnect the IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Note: The following steps are checking for a short between the Driver Circuits.</p> <p>Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 891</p>	All
891	<p>If there are no potential causes remaining, the IAC Motor is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the IAC Motor.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:

*** CHECKING THE INTAKE AIR TEMP SENSOR**

POSSIBLE CAUSES
IAT SENSOR DEFECTIVE

DRIVEABILITY

* CHECKING THE INTAKE AIR TEMP SENSOR — Continued

TEST	ACTION	APPLICABILITY
892	<p>Ignition On, Engine Not Running</p> <p>Note: Make sure the ignition key is on at this time (engine off).</p> <p>Note: Do not allow more than a 5 minute delay between next steps.</p> <p>With the DRB, read the IAT Sensor and record the reading.</p> <p>Turn ignition off.</p> <p>Remove the IAT Sensor.</p> <p>Using a Temperature Probe, measure the IAT inside IAT Sensor opening.</p> <p>Is the IAT recording within 10 degrees of the probe reading?</p> <p>Yes → Test Complete.</p> <p>No → Replace the IAT Sensor.</p> <p>Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:*** CHECKING THE OXYGEN SENSOR HEATER****POSSIBLE CAUSES**

ANY UPSTREAM O2 SENSOR VOLTAGE BELOW 1.0 VOLT
ASD RELAY OUTPUT CIRCUIT OPEN
HEATER GROUND CIRCUIT OPEN
O2 SENSOR DEFECTIVE

DRIVEABILITY

* CHECKING THE OXYGEN SENSOR HEATER — Continued

TEST	ACTION	APPLICABILITY
893	<p>Ignition On, Engine Not Running With the DRB, actuate the O2 Sensor Heater Test. Note: Use appropriate O2 Sensor Connector when performing this test. (1/1 or 1/2) Wait two minutes for O2 Sensor voltage to stabilize. With the DRB, read the 1/1 and 1/2 O2 Sensor voltages. Are any of the voltages for the O2 Sensors above 1.0 volt?</p> <p>Yes → Go To 894</p> <p>No → Stop the actuation test. O2 Sensor Heaters are OK at this time. Test passed.</p>	All
894	<p>With the DRB, actuate the O2 Sensor Heater Test. Wait two minutes for O2 Sensor voltage to stabilize. With the DRB, read the O2 Sensor voltages. Note: The O2 Sensor voltage staying above 1.0 volt indicates a problem with that Sensor(s). Disconnect the O2 Sensor Connector(s) that has voltage above 1.0 volt. Note: Check connectors - Clean/repair as necessary. Using a voltmeter, measure the ASD Relay Output Circuit voltage at Sensor Connector(s). Is the voltage above 10.0 volts?</p> <p>Yes → Go To 895</p> <p>No → Repair the open ASD Relay Output Circuit to the O2 Sensor Connector. Perform Powertrain Verification Test VER-2A.</p>	All
895	<p>Ignition On, Engine Not Running With the DRB, actuate the ASD O2 Heater test. Wait two minutes for O2 Sensor voltage to stabilize. With the DRB, read the O2 Sensor voltages. Note: The O2 Sensor voltage staying above 1.0 volt indicates a problem with that Sensor(s). Turn ignition off. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the Heater Ground Circuit and a good ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 896</p> <p>No → Repair the open Heater Ground Circuit to the O2 Sensor. Perform Powertrain Verification Test VER-2A.</p>	All
896	<p>If there are no potential causes remaining, the O2 Sensor(s) is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the O2 Sensor. Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:*** CHECKING THE PARK/NEUTRAL SWITCH (AUTO ONLY)****POSSIBLE CAUSES**

PNP SWITCH DEF

PNP SWITCH SENSE CIRCUIT OPEN

PNP SWITCH SENSE CIRCUIT SHORTED TO GROUND

PCM DEF (PNP SWITCH)

DRIVEABILITY

* CHECKING THE PARK/NEUTRAL SWITCH (AUTO ONLY) — Continued

TEST	ACTION	APPLICABILITY
897	<p>Ignition On, Engine Not Running</p> <p>With the DRB, read Park/Neutral Switch Input State.</p> <p>While moving gear selector from Park to 1 and back to Park, watch DRB display. Did the display show P/N and D/R in the correct positions?</p> <p>Yes → Test Complete.</p> <p>No → Go To 898</p>	All
898	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the P/N Switch Sense Circuit and ground (B (-)).</p> <p>Observe ohmmeter display while moving gear selector from park to 1 and back to park.</p> <p>Did the display stay below 10.0 ohms at all times?</p> <p>Yes → Repair the P/N Switch Sense Circuit for a short to ground. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 899</p>	All
899	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Park/Neutral Position Switch Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the P/N Switch Sense Circuit from the PCM Connector to the P/N Switch Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 900</p> <p>No → Repair the open P/N Switch Sense Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
900	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance between the P/N Switch Sense Circuit and ground (B (-)).</p> <p>Observe ohmmeter display while moving gear selector from park to 1 and back to park.</p> <p>Did the display switch from below 10.0 ohms to above 10.0 ohms?</p> <p>Yes → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-2A.</p> <p>No → Go To 901</p>	All
901	<p>If there are no potential causes remaining, the Park/Neutral Position Switch is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Park/Neutral Position Switch. Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:*** CHECKING THE PCM POWER AND GROUND CIRCUITS****POSSIBLE CAUSES**

PCM GROUND CIRCUIT OPEN AT CAVITY A31

PCM GROUND CIRCUIT OPEN AT CAVITY A32

FUSED B(+) CIRCUIT OPEN

FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN

DRIVEABILITY

* CHECKING THE PCM POWER AND GROUND CIRCUITS — Continued

TEST	ACTION	APPLICABILITY
902	<p>Ignition Off Disconnect the black PCM Connector. Note: Check connectors - Clean/repair as necessary. With a Voltmeter, measure Cavity A22 in the black PCM Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 903</p> <p>No → Repair the open Fused B(+) Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
903	<p>Ignition Off Disconnect the black PCM Connector. Note: Check connectors - Clean/repair as necessary. Turn the Ignition Switch on. With a Voltmeter, measure Cavity A2 in the black PCM Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 904</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
904	<p>Ignition Off Disconnect the black PCM Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure Cavity A31 in the black PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 905</p> <p>No → Repair the open Ground Circuit. Perform Powertrain Verification Test VER-2A.</p>	All
905	<p>Ignition Off Disconnect the black PCM Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure Cavity A32 in the black PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Test Complete.</p> <p>No → Repair the open Ground Circuit. Perform Powertrain Verification Test VER-2A.</p>	All

Symptom:*** CHECKING THE RADIATOR FAN OPERATION****POSSIBLE CAUSES**

FUSED IGNITION SWITCH OUT CKT OPEN

RADIATOR FAN GROUND CIRCUIT OPEN

RADIATOR FAN RELAY OUTPUT CIRCUIT OPEN

RADIATOR FAN MOTOR DEFECTIVE

RADIATOR FAN RELAY DEFECTIVE

RADIATOR FAN RELAY FAULT CODE PRESENT

DRIVEABILITY

* CHECKING THE RADIATOR FAN OPERATION — Continued

TEST	ACTION	APPLICABILITY
906	<p>Ignition On, Engine Not Running With the DRB, actuate the Rad Fan Relay. Did the Rad Fan actuate?</p> <p>Yes → Go To 907</p> <p>No → Go To 908</p>	All
907	<p>Ignition On, Engine Not Running With DRB, read fault codes. Is there a Rad Fan Relay Fault Code?</p> <p>Yes → Repair all Rad Fan Relay Fault Codes.</p> <p>No → Test Complete.</p>	All
908	<p>Ignition On, Engine Not Running With DRB, read fault codes. Is there a Rad Fan Relay Fault Code?</p> <p>Yes → Repair all Rad Fan Relay Fault Codes.</p> <p>No → Go To 909</p>	All
909	<p>Ignition Off Disconnect the Rad Fan Motor Connector. Note: Check connectors - Clean/repair as necessary. Key on. Actuate the Rad Fan. With a Voltmeter, measure the Rad Fan Relay Output at the Fan. Does the voltage pulsate?</p> <p>Yes → Go To 910</p> <p>No → Go To 912</p>	All
910	<p>Ignition Off Disconnect the Rad Fan Motor Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Rad Fan Ground Circuit to a ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 911</p> <p>No → Repair the open Rad Fan Ground Circuit. Perform Powertrain Verification Test VER-2A</p>	All
911	<p>If there are no potential causes remaining, the Radiator Fan Motor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Rad Fan Motor. Perform Powertrain Verification Test VER-2A</p>	All

* CHECKING THE RADIATOR FAN OPERATION — Continued

TEST	ACTION	APPLICABILITY
912	<p>Ignition Off Remove Rad Fan Relay. Note: Check connectors - Clean/repair as necessary. Key on. With a Voltmeter, measure the Fused Ignition Switch Output Ckt at the Relay. Is the voltage above 11.0 volts?</p> <p>Yes → Go To 913</p> <p>No → Repair the open Fused Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-2A</p>	All
913	<p>Ignition Off Disconnect the Rad Fan Motor Connector. Note: Check connectors - Clean/repair as necessary. Remove Rad Fan Relay. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Rad Fan Relay Output from the Relay to the Rad Fan Motor. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 914</p> <p>No → Repair the open Rad Fan Relay Output Circuit. Perform Powertrain Verification Test VER-2A</p>	All
914	<p>If there are no potential causes remaining, the Radiator Fan Relay is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Rad Fan Relay. Perform Powertrain Verification Test VER-2A</p>	All

DRIVEABILITY

Symptom:

*** CHECKING TPS CALIBRATION**

POSSIBLE CAUSES
TPS CONNECTORS/HARNESS INTERMITTENT DEFECT (B)
THROTTLE POSITION SENSOR DEFECTIVE (A)
THROTTLE POSITION SENSOR DEFECTIVE (B)
TPS HARNESS/CONNECTORS INTERMITTENT DEFECT (A)
TPS HARNESS/CONNECTORS OBSERVABLE DEFECT

* CHECKING TPS CALIBRATION — Continued

TEST	ACTION	APPLICABILITY
915	<p>Engine Running With the DRB, read TP Sensor voltage. Wiggle the Throttle Position Sensor Connectors and Harness. Monitor engine RPM. Was there any change in engine RPM when wiggled?</p> <p>Yes → Repair the Harness or Connector that caused the engine RPM to change. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 916</p>	All
916	<p>Ignition On, Engine Not Running With the DRB, read TP Sensor voltage. Throttle must be against stop. Is the voltage 0.92 or less with the Throttle closed?</p> <p>Yes → Go To 917</p> <p>No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-1A.</p>	All
917	<p>Ignition On, Engine Not Running With the DRB, read TP Sensor voltage. While monitoring the DRB, slowly open and close the Throttle. Is the voltage change smooth?</p> <p>Yes → Go To 918</p> <p>No → Replace the Throttle Position Sensor. Perform Powertrain Verification Test VER-1A.</p>	All
918	<p>Ignition On, Engine Not Running With the DRB, read TP Sensor voltage. Stop moving the Linkage. Wiggle the Throttle Position Sensor Connectors and Harness. Monitor the DRB display. Was there any change in Throttle Position Sensor voltage when wiggled?</p> <p>Yes → Repair the Harness or Connector that caused the voltage change. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 919</p>	All
919	<p>Ignition Off Using the schematic as a guide, inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-1A.</p> <p>No → Test Complete.</p>	All

SPEED CONTROL

Symptom:

*** CHECKING BRAKE SWITCH SENSE**

POSSIBLE CAUSES
GROUND CIRCUIT OPEN
POWERTRAIN CONTROL MODULE TERMINAL OBSERVABLE DEFECT
BRAKE SWITCH DEFECTIVE
BRAKE SWITCH SENSE CIRCUIT SHORTED TO GROUND
BRAKE SWITCH SENSOR CIRCUIT OPEN
POWERTRAIN CONTROL MODULE DEFECTIVE

* CHECKING BRAKE SWITCH SENSE — Continued

TEST	ACTION	APPLICABILITY
920	<p>Ignition On Disconnect the Brake Switch Connector. Note: Check connectors - Clean/repair as necessary. With the DRB, measure the voltage of the Brake Switch Sense Circuit at the Brake Switch Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 921 No → Go To 923</p>	All
921	<p>Ignition On Disconnect the Brake Switch Connector. Note: Check connectors - Clean/repair as necessary. Connect a jumper between the Brake switch Sense and ground in Brake Switch Connector. With the DRB, read the Brake Switch Input Status. Does the DRB show Brake Switch Released?</p> <p>Yes → Go To 922 No → Repair the open Ground Circuit. Perform Powertrain Verification Test VER-4A.</p>	All
922	<p>If there are no potential causes remaining, the Brake Switch is assumed to be defective. View repair options.</p> <p>Repair Replace the Brake Switch. Perform Powertrain Verification Test VER-4A.</p>	All
923	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Inspect Powertrain Control Module Connector Terminals. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-4A. No → Go To 924</p>	All
924	<p>Ignition Off Disconnect the Brake Switch Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Brake Switch Sense Circuit at Powertrain Control Module Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Brake Switch Sense Circuit, shorted to ground. Perform Powertrain Verification Test VER-4A. No → Go To 925</p>	All

SPEED CONTROL

*** CHECKING BRAKE SWITCH SENSE — Continued**

TEST	ACTION	APPLICABILITY
925	Ignition Off Disconnect the Brake Switch Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the Brake Switch Sense Circuit from Powertrain Control Module to the Brake Switch. Is the resistance below 5.0 ohms? Yes → Go To 926 No → Repair the open Brake Switch Sense Circuit. Brake Switch to Powertrain Control Module. Perform Powertrain Verification Test VER-4A.	All
926	If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options. Repair Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-4A.	All

Symptom:*** CHECKING FOR A SPEED CONTROL DENIED MESSAGE**

TEST	ACTION	APPLICABILITY
927	<p>At this time the S/C switch and servo functions appear to operate properly. Using the DRB, monitor the speed control "cutout" status.</p> <p>Road test the vehicle at speeds over 35mph and attempt to set the speed control. The following items will not allow the speed control to set. The last or most recent cause for speed control not to set is indicated by the "Denied" status.</p> <p>If ON/OFF Denied message is indicated, the Powertrain Control Module does not see an "ON" signal from the switch.</p> <p>If SPEED Denied message is indicated, the vehicle speed as seen by the Powertrain Control Module is not greater than 36 mph.</p> <p>If RPM Denied message is indicated, the engine rpm is excessively high.</p> <p>If BRAKE Denied message is indicated, the Brake Switch Sense Circuit is open indicating to the PCM that the Brakes are applied. The Sense Circuit is grounded through the Brake Pedal Switch when the Brakes are released.</p> <p>If P/N Denied message is indicated, Park/Neutral Switch Sense Circuit is grounded indicating to PCM that transmission is not in gear. The Sense Circuit is grounded through the Park/Neutral Switch when transmission is in park or neutral.</p> <p>If RPM/SPD Denied message is indicated, the PCM senses excessive engine rpm for a given vehicle speed.</p> <p>If SOL FLT Denied message is indicated, the Powertrain Control Module senses a Servo Solenoid Circuit trouble code that is maturing or set in memory.</p> <p>Test Complete.</p>	All

SPEED CONTROL

Symptom:

*** CHECKING SPEED CONTROL ON/OFF SWITCH**

POSSIBLE CAUSES

CLOCKSPRING DEFECTIVE

SPEED CONTROL SWITCH SIGNAL CIRCUIT SHORT TO GROUND

SPEED CONTROL ON/OFF SWITCH DEFECTIVE

SPEED CONTROL ON/OFF/SET SWITCH DEFECTIVE

SPEED CONTROL SWITCH SIGNAL CIRCUIT OPEN OR HIGH RESISTANCE

SPEED CONTROL SWITCH SIGNAL CIRCUIT SHORTED TO VOLTAGE

PCM DEF (CHECKING S/C OPERATION)

POWERTRAIN CONTROL MODULE DEFECTIVE

SPEED CONTROL RESUME/ACCEL SWITCH DEFECTIVE

* CHECKING SPEED CONTROL ON/OFF SWITCH — Continued

TEST	ACTION	APPLICABILITY
928	<p>Ignition On</p> <p>With the DRB, read the Speed Control Switch voltage.</p> <p>Does the DRB show Speed Control Switch above 4.0 Volts?</p> <p>Yes → Go To 929</p> <p>No → Go To 933</p>	All
929	<p>Ignition Off</p> <p>Disconnect the Speed Control On/Off Switch.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper between Speed Control Switch Signal and ground.</p> <p>Ignition on, engine not running.</p> <p>With the DRB, read the Speed Control Switch voltage.</p> <p>Does the DRB show Speed Control Switch is less than 1.0 Volt?</p> <p>Yes → Replace the Speed Control On/Off Switch.</p> <p>Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 930</p>	All
930	<p>Ignition On</p> <p>Disconnect the Speed Control On/Off Switch.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Voltmeter, measure the voltage of the Speed Control Switch Signal Circuit from the S/C Switch Connector to a good ground.</p> <p>Is the voltage below 4.0 volts?</p> <p>Yes → Repair the Speed Control Switch Signal Circuit for an open or high resistance.</p> <p>Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 931</p>	All
931	<p>Ignition On</p> <p>Disconnect the Speed Control On/Off Switch.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using a Voltmeter, measure the voltage of the Speed Control Switch Signal Circuit from S/C Switch connector to a good ground.</p> <p>Is the voltage above 6.0 Volts?</p> <p>Yes → Repair the Speed Control Switch Signal Circuit shorted to voltage.</p> <p>Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 932</p>	All
932	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective.</p> <p>View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All

SPEED CONTROL

* CHECKING SPEED CONTROL ON/OFF SWITCH — Continued

TEST	ACTION	APPLICABILITY
933	<p>Ignition On Disconnect the Speed Control On/Off/Set Switch. Note: Check connectors - Clean/repair as necessary. With the DRB, read the Speed Control Switch voltage. Does the DRB show Speed Control Switch above 4.0 Volts?</p> <p>Yes → Replace the On/Off/Set Switch. Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 934</p>	All
934	<p>Ignition On Disconnect the Clockspring Connector. Note: Check connectors - Clean/repair as necessary. With the DRB, read the Speed Control Switch voltage. Does the DRB show Speed Control Switch above 4.0 Volts?</p> <p>Yes → Replace the Clockspring. Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 935</p>	All
935	<p>Ignition Off Disconnect the Speed Control On/Off/Set Switch. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Speed Control Switch Signal Circuit from Speed Control Switch to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Speed Control Switch Signal Circuit for a short to ground. Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 936</p>	All
936	<p>Ignition On Disconnect the Speed Control Resume/Accel Switch. Note: Check connectors - Clean/repair as necessary. With the DRB, read the Speed Control Switch voltage. Does the DRB show Speed Control Switch above 4.0 Volts?</p> <p>Yes → Replace the Speed Control Resume/Accel Switch. Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 937</p>	All
937	<p>If there are no potential causes remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair Replace the PCM. Perform Powertrain Verification Test VER-4A.</p>	All

Symptom:

*** CHECKING SPEED CONTROL RESUME/ACCEL SWITCH**

POSSIBLE CAUSES
SPEED CONTROL GROUND CIRCUIT OPEN
SPEED CONTROL RESUME/ACCEL SWITCH DEFECTIVE
SPEED CONTROL SWITCH SIGNAL SWITCH OPEN

SPEED CONTROL

*** CHECKING SPEED CONTROL RESUME/ACCEL SWITCH — Continued**

TEST	ACTION	APPLICABILITY
938	<p>Ignition Off</p> <p>Disconnect the Speed Control Resume/Accel Switch.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the Ground Circuit from the Speed Control Resume/Accel Connector to a good ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 939</p> <p>No → Repair the open Ground Circuit to Speed Control Resume/Accel Switch Connector.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All
939	<p>Ignition On</p> <p>Disconnect the Speed Control Resume/Accel Switch.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Connect a jumper between the Speed Control Switch Signal and ground.</p> <p>With the DRB, read the Speed Control Switch voltage.</p> <p>Does the DRB show Speed Control Switch is less than 1.0 volt?</p> <p>Yes → Replace the Speed Control Resume/Accel Switch.</p> <p>Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 940</p>	All
940	<p>If there are no potential causes remaining, the S/C Switch Signal Circuit is assumed to be open to the Clockspring Connector.</p> <p>View repair options.</p> <p>Repair</p> <p>Repair the open Speed Control Switch Signal Circuit to the Clockspring Connector.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All

Symptom:*** CHECKING THE SPEED CONTROL OPERATION**

POSSIBLE CAUSES
S/C VACUUM SOLENOID CONTROL CIRCUIT OPEN
SPEED CONTROL GROUND CIRCUIT OPEN
SPEED CONTROL VENT SOLENOID CONTROL CIRCUIT OPEN
S/C SERVO VACUUM SUPPLY HAS LEAK OR RESTRICTION
THROTTLE CABLE OBSERVABLE DEF
S/C SERVO DEF
SPEED CONTROL SERVO CONNECTOR OBSERVABLE DEFECT
SPEED CONTROL CANCEL SWITCH DEFECTIVE
SPEED CONTROL COAST SWITCH DEFECTIVE
SPEED CONTROL SET SWITCH DEFECTIVE
VACUUM CHECK VALVE DEFECTIVE

SPEED CONTROL

* CHECKING THE SPEED CONTROL OPERATION — Continued

TEST	ACTION	APPLICABILITY
941	<p>Ignition On, Engine Not Running</p> <p>Note: Use this test only when there are no Speed Control Codes set.</p> <p>With the DRB, monitor the Speed Control Switch Inputs.</p> <p>While observing display, press the Speed Control On/Off Switch several times.</p> <p>Does the DRB show Speed Control Switch "On/Off"?</p> <p>Yes → Go To 942</p> <p>No → Refer to symptom * CHECKING SPEED CONTROL ON/OFF SWITCH in the SPEED CONTROL category.</p>	All
942	<p>Ignition On, Engine Not Running</p> <p>Turn the Speed Control On/Off Switch on.</p> <p>With the DRB, monitor the Speed Control Switch inputs.</p> <p>While observing the display, press the Resume/Accel Switch several times.</p> <p>Does the DRB show Resume/Accel Switch status change from "Pressed" to "Released"?</p> <p>Yes → Go To 943</p> <p>No → Refer to symptom * CHECKING SPEED CONTROL RESUME/ACCEL SWITCH in the SPEED CONTROL category.</p>	All
943	<p>Ignition on, Engine Not Running</p> <p>Turn the Speed Control On/Off Switch on.</p> <p>With the DRB, monitor the Speed Control Switch inputs.</p> <p>While observing the display, press the Brake Pedal several times.</p> <p>Does the DRB show Brake Switch status changed from "Pressed" to "Released"?</p> <p>Yes → Go To 944</p> <p>No → Refer to symptom * CHECKING BRAKE SWITCH SENSE in the SPEED CONTROL category.</p>	All
944	<p>Ignition On, Engine Not Running</p> <p>Turn the Speed Control On/Off Switch on.</p> <p>With the DRB, monitor the Speed Control Switch inputs.</p> <p>While observing the display, press the Cancel Switch several times.</p> <p>Does the DRB show Cancel switch Pressed or Released?</p> <p>Yes → Go To 945</p> <p>No → Replace the Cancel Switch.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All
945	<p>Ignition On, Engine Not Running.</p> <p>With the DRB, monitor the Speed Control Switch inputs.</p> <p>While observing the display, move the Gear Selector to Drive.</p> <p>Does the DRB show the Park/Neutral Switch in "Drive/Reverse"?</p> <p>Yes → Go To 946</p> <p>No → Refer to symptom P-1899 P/N SWITCH STUCK IN PARK OR IN GEAR in the DRIVEABILITY category.</p>	All

* CHECKING THE SPEED CONTROL OPERATION — Continued

TEST	ACTION	APPLICABILITY
946	<p>Ignition On, Engine Not Running With the DRB, actuate the Speed Control Vent Solenoid. Using a 12-Volt Test Light to ground, backprobe the Speed Control Brake Switch Output Circuit. Is the Light illuminated and bright?</p> <p>Yes → Go To 947</p> <p>No → Refer to symptom * CHECKING BRAKE SWITCH SENSE in the SPEED CONTROL category.</p>	All
947	<p>Engine Running Allow engine to idle for 1 minute. Ignition on, engine not running. With the DRB, actuate the Speed Control Servo Solenoids. Does the Throttle open and close?</p> <p>Yes → Refer to symptom * CHECKING FOR A SPEED CONTROL DENIED MESSAGE in the SPEED CONTROL category.</p> <p>No → Go To 948</p>	All
948	<p>Ignition Off Inspect the Throttle Cable. Is the Cable disconnected or damaged?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 949</p>	All
949	<p>Ignition Off Disconnect the Speed Control Servo Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the resistance of the Ground Circuit to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 950</p> <p>No → Repair the open Ground Circuit. Perform Powertrain Verification Test VER-4A.</p>	All
950	<p>Ignition On, Engine Not Running Turn the Speed Control On/Off Switch on. With the DRB, monitor the Speed Control Switch inputs. While observing the display, press the Coast Switch several times. Does the DRB show Coast Switch status changed from Pressed to Released?</p> <p>Yes → Go To 951</p> <p>No → Replace the Coast Switch. Perform Powertrain Verification Test VER-4A.</p>	All
951	<p>Ignition Off Disconnect the Vacuum Supply to the Speed Control Servo. Attach a Vacuum Gauge to the disconnected hose and start engine. Does the Vacuum Gauge read Manifold Vacuum?</p> <p>Yes → Go To 952</p> <p>No → Repair the Vacuum Supply for a leak or restriction. Perform Powertrain Verification Test VER-4A.</p>	All

SPEED CONTROL

* CHECKING THE SPEED CONTROL OPERATION — Continued

TEST	ACTION	APPLICABILITY
952	<p>Ignition On, Engine Not Running</p> <p>With the DRB, monitor the Speed Control Switch inputs.</p> <p>Turn the Speed Control On/Off Switch on.</p> <p>While observing the display, press the Speed Control Set Switch several times.</p> <p>Does the DRB show the Set Switch status change from Pressed to Released?</p> <p>Yes → Go To 953</p> <p>No → Replace Set Switch.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All
953	<p>Ignition Off</p> <p>Disconnect the Speed Control Servo Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Inspect Speed Control Servo Connector.</p> <p>Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary.</p> <p>Perform Powertrain Verification Test VER-4A.</p> <p>No → Go To 954</p>	All
954	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Speed Control Servo 4-way Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With an Ohmmeter, measure the resistance of the S/C Vacuum Solenoid Control Circuit from the PCM Connector to S/C Servo Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 955</p> <p>No → Repair the open Speed Control Vacuum Solenoid Control Circuit.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All
955	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module..</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Speed Control Servo 4-way Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the S/C Vent Solenoid Control Circuit from the PCM Connector to the S/C Servo Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 956</p> <p>No → Repair the open S/C Vent Solenoid Control Circuit.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All
956	<p>Ignition Off</p> <p>Disconnect the Vacuum Supply to the Speed Control Servo.</p> <p>Attach a Vacuum Gauge to the disconnected Hose.</p> <p>Start engine.</p> <p>When Vacuum Gauge reads manifold vacuum, turn ignition off.</p> <p>Observe Vacuum Gauge for 10 seconds.</p> <p>Does the Vacuum hold for at least 10 seconds?</p> <p>Yes → Go To 957</p> <p>No → Replace the Vacuum Check Valve.</p> <p>Perform Powertrain Verification Test VER-4A.</p>	All

*** CHECKING THE SPEED CONTROL OPERATION — Continued**

TEST	ACTION	APPLICABILITY
957	If there are no potential causes remaining, the Speed Control Servo is assumed to be defective. View repair options. Repair Replace the Speed Control Servo. Perform Powertrain Verification Test VER-4A.	All

STARTING

Symptom:

*** CHECKING FUEL PUMP**

POSSIBLE CAUSES
FUEL PUMP RELAY OUTPUT CIRCUIT OPEN
FUEL PUMP DEFECTIVE
FUEL PUMP GROUND CIRCUIT OPEN
FUEL PUMP RELAY DEF
FUEL PUMP RELAY FUSED B(+) CKT OPEN TO SPLICE

* CHECKING FUEL PUMP — Continued

TEST	ACTION	APPLICABILITY
958	<p>Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Install a substitute Relay of the same part number for the Fuel Pump Relay. Attempt to start the engine. Does the engine start?</p> <p>Yes → Replace the Fuel Pump Relay. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 959</p>	All
959	<p>Ignition Off Disconnect the Fuel Pump Module Connector. Note: Check connectors - Clean/repair as necessary. Caution: It is critical that the Fuel Pump Module Connector has a clean and tight connection. Ignition On, Engine Not Running With the DRB, actuate the Fuel System. With a Voltmeter, measure the Fuel Pump Relay Output Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 960</p> <p>No → Repair the open Fuel Pump Relay Output Circuit. Perform Powertrain Verification Test VER-1A.</p>	All
960	<p>Ignition Off Disconnect the Fuel Pump Relay. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running Using a Voltmeter, measure the Fuel Pump Relay Fused B(+) Circuit voltage. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 961</p> <p>No → Repair the Fuel Pump Relay B(+) Circuit for an open to splice. Perform Powertrain Verification Test VER-1A.</p>	All
961	<p>Ignition Off Disconnect the Fuel Pump Module Connector. Note: Check connectors - Clean/repair as necessary. Caution: It is critical that the Fuel Pump Module Connector has a clean and tight connection. With an Ohmmeter, measure the Fuel Pump Ground Circuit in the Fuel Pump Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 962</p> <p>No → Repair the open Fuel Pump Ground Circuit. Perform Powertrain Verification Test VER-1A.</p>	All
962	<p>If there are no potential causes remaining, the Fuel Pump is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Fuel Pump. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** CHECKING FUEL SYSTEM**

POSSIBLE CAUSES
AUTO SHUTDOWN RELAY OUTPUT CIRCUIT OPEN
THROTTLE CABLE OBSTRUCTION
FUEL SYSTEM FILTER(S) DEFECTIVE

* CHECKING FUEL SYSTEM — Continued

TEST	ACTION	APPLICABILITY
963	<p>Ignition On, Engine Not Running With the DRB, actuate the Fuel System. Note: It may be necessary to use a mechanics stethoscope in the next step. Listen for Fuel Pump operation at the Fuel Tank. Can the Fuel Pump operation be heard?</p> <p>Yes → Go To 964</p> <p>No → Refer to symptom * CHECKING FUEL PUMP in the STARTING category.</p>	All
964	<p>Ensure the Throttle Cable is not holding the Throttle open. Is the Throttle being held open by the Cable?</p> <p>Yes → Repair the condition that is holding the Throttle open. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 965</p>	All
965	<p>Ignition Off Warning: The Fuel System must be opened and may be under high pressure. Install a Fuel Pressure Gauge to the Fuel System. Note: The Fuel Tank must be at least 1/4 full for the following tests. Turn ignition on. With DRB, actuate the Fuel System. Read the Fuel Pressure Gauge. Is the fuel pressure below 44.2 psi?</p> <p>Yes → Refer to symptom * LOW FUEL PRESSURE in the STARTING category.</p> <p>No → Go To 966</p>	All
966	<p>Ignition Off Warning: The Fuel System must be opened and may be under high pressure. Install a Fuel Pressure Gauge to Fuel System. Note: The Fuel Tank must be at least 1/4 full for the following tests. Turn ignition on. With DRB, actuate the Fuel System. Read the Fuel Pressure Gauge. Is the fuel pressure above 54.2 psi?</p> <p>Yes → Replace the Fuel Filter/Regulator and Primary Filter. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 967</p>	All
967	<p>Ignition Off Disconnect the #1 Injector. Note: Check connectors - Clean/repair as necessary. Key on. With the DRB, actuate the ASD Relay. With a Voltmeter, measure the ASD Relay Output Circuit. Is the voltage pulsating from 0.0 volts to above 10.5 volts?</p> <p>Yes → Test Complete.</p> <p>No → Repair the open ASD Relay Output Circuit to splice. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

* CHECKING IAC MOTOR

POSSIBLE CAUSES

IAC #1 DRIVER CIRCUIT SHORTED TO #2, #3, OR #4

IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4

IAC #3 DRIVER CIRCUIT SHORTED TO #4

IAC #4 DRIVER CIRCUIT SHORTED TO GROUND

IAC MOTOR DEFECTIVE

IAC MOTOR DRIVER (IAC #1) CIRCUIT OPEN

IAC MOTOR DRIVER (IAC #2) CIRCUIT OPEN

IAC MOTOR DRIVER (IAC #3) CIRCUIT OPEN

IAC MOTOR DRIVER (IAC #4) CIRCUIT OPEN

PCM CONN (IAC #1) TERM DAM, PUSHED OUT, OR MISWIRD

PCM CONN (IAC #2) TERM DAM, PUSHED OUT OR MISWIRED

PCM CONN (IAC #3) TERM DAM, PUSHED OUT OR MISWIRED

PCM CONN (IAC #4) TERM DAM, PUSHED OUT OR MISWIRED

PCM CONNECTOR OBSERVABLE DEFECT

IDLE AIR CONTROL MOTOR DEFECTIVE

THROTTLE BODY RESTRICTED

IAC #1 DRIVER CIRCUIT SHORTED TO GROUND

IAC #1 DRIVER CKT SHORTED TO ANOTHER DRIVER CKT

IAC #2 DRIVER CIRCUIT SHORTED TO #3 OR #4

IAC #2 DRIVER CIRCUIT SHORTED TO GROUND

IAC #3 DRIVER CIRCUIT SHORTED TO GROUND

IAC #3 DRIVER CKT SHORTED TO IAC #4 DRIVER CKT

IAC MOTOR CIRCUIT WIRING HARNESS INTERMITTENT DEF

IAC MOTOR CIRCUIT WIRING HARNESS OBSERVABLE DEF

PCM DEF (IAC #1)

PCM DEF (IAC #2)

PCM DEF (IAC #3)

PCM DEF (IAC #4)

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
968	<p>Ignition Off Hold the engine Throttle 1/4 of the way down and attempt to start the engine. Does the engine start and stay running and then stall when Throttle is released?</p> <p>Yes → Go To 969</p> <p>No → Refer to symptom * REPAIRING A START AND STALL CONDITION in the STARTING category.</p>	All
969	<p>Ignition Off Disconnect the Idle Air Control Motor Connector. Note: Check connectors - Clean/repair as necessary. Key on. With DRB, actuate the Idle Air Control Motor. Use a Voltmeter in the following steps. Measure the Idle Air Control #1 Driver Ckt. Did the voltage stay below 1.0 volt?</p> <p>Yes → Go To 970</p> <p>No → Go To 989</p>	All
970	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 971</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
971	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 972</p>	All
972	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 973</p> <p>No → Go To 1102</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
973	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 974 No → Go To 987	All
974	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 975 No → Go To 1004	All
975	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 976 No → Go To 1022	All
976	Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM? Yes → Go To 977 No → Go To 986	All
977	Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM? Yes → Go To 978 No → Go To 986	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
978	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 979 No → Go To 982</p>	All
979	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 980</p>	All
980	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 981</p>	All
981	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1099</p>	All
982	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 983</p>	All
983	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 984</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
984	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 985</p>	All
985	<p>Ignition Off</p> <p>Disconnect IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect Powertrain Control Module Connector (Black).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure between IAC Driver #4 and ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1041</p>	All
986	<p>Ignition Off</p> <p>Disconnect IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect Powertrain Control Module Connector (Black).</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure between IAC Driver #1 and ground.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1095</p>	All
987	<p>Ignition Off</p> <p>Disconnect the IAC Motor Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the PCM Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 988</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
988	<p>Ignition Off</p> <p>Disconnect the PCM Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1091</p>	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
989	<p>Ignition Off Disconnect the Idle Air Control Motor Connector. Note: Check connectors - Clean/repair as necessary. Key on. With DRB, actuate the Idle Air Control Motor. Use a Voltmeter in the following steps. Measure the Idle Air Control #2 Driver Ckt. Did the voltage stay below 1.0 volt?</p> <p>Yes → Go To 990 No → Go To 1006</p>	All
990	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 991 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
991	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 992</p>	All
992	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 993 No → Go To 1091</p>	All
993	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 994 No → Go To 1004</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
994	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 995 No → Go To 1022</p>	All
995	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 996 No → Go To 1002</p>	All
996	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 997 No → Go To 1002</p>	All
997	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 998 No → Go To 1001</p>	All
998	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 999</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
999	Ignition Off Inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1000	All
1000	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1088	All
1001	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1037 No → Go To 1055	All
1002	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1003 No → Go To 1092	All
1003	Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms? Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 1084	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1004	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1005</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1005	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1080</p>	All
1006	<p>Ignition Off Disconnect the Idle Air Control Motor Connector. Note: Check connectors - Clean/repair as necessary. Key on. With DRB, actuate the Idle Air Control Motor. Use a Voltmeter in the following steps. Measure the Idle Air Control #3 Driver Ckt. Did the voltage stay below 1.0 volt?</p> <p>Yes → Go To 1007</p> <p>No → Go To 1024</p>	All
1007	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1008</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1008	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1009</p>	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1009	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1010 No → Go To 1080	All
1010	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1011 No → Go To 1022	All
1011	Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM? Yes → Go To 1012 No → Go To 1019	All
1012	Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM? Yes → Go To 1013 No → Go To 1019	All
1013	Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly? Yes → Go To 1014 No → Go To 1017	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1014	Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time? Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1015	All
1015	Ignition Off Inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1016	All
1016	Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1077	All
1017	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1018 No → Go To 1055	All
1018	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1037 No → Go To 1051	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1019	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1020 No → Go To 1092</p>	All
1020	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1021 No → Go To 1081</p>	All
1021	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1073</p>	All
1022	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1023 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1023	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1103</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1024	<p>Ignition Off Disconnect the Idle Air Control Motor Connector. Note: Check connectors - Clean/repair as necessary. Key on. With DRB, actuate the Idle Air Control Motor. Use a Voltmeter in the following steps. Measure the Idle Air Control #4 Driver Ckt. Did the voltage stay below 1.0 volt?</p> <p>Yes → Go To 1025 No → Go To 1104</p>	All
1025	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #4 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1026 No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1026	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1027</p>	All
1027	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #4 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1028 No → Go To 1103</p>	All
1028	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 1400 RPM. Note: Release Throttle. Is the engine speed 1400 +/- 100 RPM?</p> <p>Yes → Go To 1029 No → Go To 1059</p>	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1029	<p>Turn ignition off for 10 seconds. Start engine, allow to idle for 20 seconds. Note: If the engine will not idle, hold the throttle open slightly to keep engine running. With the DRB actuate the Idle Air Control Motor to 900 RPM. Note: Release Throttle. Is the engine speed 900 +/- 100 RPM?</p> <p>Yes → Go To 1030 No → Go To 1059</p>	All
1030	<p>Ignition Off Start engine. With the DRB in Systems Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Does the Idle Speed raise and lower properly?</p> <p>Yes → Go To 1031 No → Go To 1034</p>	All
1031	<p>Ignition Off Start engine. With the DRB in System Test, perform the IAC Wiggle Test. Note: The idle speed should raise and lower with the display. Wiggle the Wiring Harness from the IAC Motor to the PCM. Observe for the IAC Motor to stop operating. Did the IAC Motor stop operating at any time?</p> <p>Yes → Repair the Harness or Connectors as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1032</p>	All
1032	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1033</p>	All
1033	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1067</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1034	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1035 No → Go To 1055</p>	All
1035	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1036 No → Go To 1051</p>	All
1036	<p>Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time?</p> <p>Yes → Go To 1037 No → Go To 1047</p>	All
1037	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A. No → Go To 1038</p>	All
1038	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1039</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1039	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1040</p>	All
1040	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1041</p>	All
1041	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1042</p>	All
1042	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1043</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1043	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1044</p>	All
1044	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1045</p>	All
1045	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1046</p>	All
1046	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-5A.</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1047	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1048</p>	All
1048	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1049</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1049	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1050</p>	All
1050	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1073</p>	All
1051	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1052</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1052	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1053</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1053	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1054</p>	All
1054	<p>Ignition Off Inspect the Wiring and Connectors. Were any problems found?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1084</p>	All
1055	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1056</p>	All
1056	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1057</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1057	Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1058	All
1058	Ignition Off Inspect the Wiring and Connectors. Were any problems found? Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A. No → Go To 1095	All
1059	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #1 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1060 No → Go To 1092	All
1060	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #2 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1061 No → Go To 1081	All
1061	Ignition Off Start engine and let idle. Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Using a Voltmeter, measure the IAC Driver #3 Circuit. Was the voltage over 5.0 volts at any time? Yes → Go To 1062 No → Go To 1070	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1062	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1063</p>	All
1063	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1064</p>	All
1064	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1065</p>	All
1065	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1066</p>	All
1066	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1067</p>	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1067	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1068</p>	All
1068	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1069</p>	All
1069	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1103</p>	All
1070	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1071</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1071	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #3 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1072</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1072	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1073</p>	All
1073	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1074</p>	All
1074	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1075</p>	All
1075	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1076</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1076	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1077</p>	All
1077	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1078</p>	All
1078	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1079</p>	All
1079	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1080</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1080	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
1081	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1082</p>	All
1082	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #2 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1083</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1083	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1084</p>	All
1084	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1085</p>	All

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1085	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1086</p>	All
1086	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1087</p>	All
1087	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1088</p>	All
1088	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1089</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1089	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1090</p>	All
1090	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1091</p>	All
1091	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
1092	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #1 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #1 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1093</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1093	<p>Ignition Off Disconnect the IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the IAC #1 Driver Circuit. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1094</p> <p>No → Repair the open IAC Motor Driver Control Circuit. Perform Powertrain Verification Test VER-5A.</p>	All
1094	<p>Ignition Off Disconnect the PCM Connector. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1095</p>	All
1095	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #4 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #4 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1096</p>	All
1096	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Is any Terminal damaged, pushed out or miswired?</p> <p>Yes → Repair as necessary. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1097</p>	All
1097	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #2 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #2 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1098</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1098	<p>Ignition Off Disconnect IAC Motor Connector. Note: Check connectors - Clean/repair as necessary. Disconnect Powertrain Control Module Connector (Black). Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure between IAC Driver #3 and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC #3 Driver Circuit shorted to ground. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1099</p>	All
1099	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1100</p>	All
1100	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1101</p>	All
1101	<p>Ignition Off Disconnect IAC Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5 ohms?</p> <p>Yes → Repair the IAC Driver Circuits shorted together. Perform Powertrain Verification Test VER-5A.</p> <p>No → Go To 1102</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1102	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-5A.</p>	All
1103	<p>If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-5A.</p>	All
1104	<p>Ignition Off Remove the Idle Air Control Motor from the Throttle Body. Key on. With DRB, actuate the Idle Air Control Motor. Is the Idle Air Control Motor Tip moving in and out?</p> <p>Yes → Go To 1105 No → Go To 1108</p>	All
1105	<p>Ignition Off Remove the Idle Air Control Motor from the Throttle Body. Inspect Throttle Body for a restriction or carbon build up. Is the Throttle Body free of restrictions?</p> <p>Yes → Go To 1107 No → Go To 1106</p>	All
1106	<p>Ignition Off Remove the Idle Air Control Motor from the Throttle Body. Inspect Throttle Body for a restriction or carbon build up. Is the Throttle Body free of restrictions?</p> <p>Yes → Go To 1107 No → Clean or replace Throttle Body. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

* CHECKING IAC MOTOR — Continued

TEST	ACTION	APPLICABILITY
1107	<p>If PCM has been changed and correct VIN & mileage haven't been programmed, a DTC will be set in ABS & Air bag modules. In addition, if vehicle is equipped with a Smart Key Immobilizer Module (SKIM), Secret Key data must be updated to enable starting.</p> <p>For ABS and Air Bag systems: ACTION: Enter correct VIN and mileage in PCM. Erase codes in ABS and Air Bag modules.</p> <p>For SKIM Theft alarm: ACTION: Connect the DRB to the data link connector. Go to Engine, Misc. and place the SKIM in secured access mode, by using the appropriate PIN code for this vehicle.</p> <p>Select Update the Secret Key data, data will be transferred from the SKIM to the PCM.</p> <p>At this point in the diagnostic test procedure, you have determined that all of the engine electrical systems are operating as designed; therefore, they are not the cause of the start and stall problem.</p> <p>The following additional items should be checked as possible mechanical causes of the no start condition. Any one or more of these items can produce a no start condition; none can be overlooked as a possible cause.</p> <ol style="list-style-type: none"> 1. DISTRIBUTOR POSITION - must be within specifications* 2. ENGINE VALVE TIMING - must be within specifications 3. ENGINE COMPRESSION - must be within specifications 4. ENGINE EXHAUST - must be free of any restrictions 5. ENGINE PCV SYSTEM - must flow freely 6. ENGINE DRIVE SPROCKETS - must be properly positioned 7. FUEL - must be free of contamination 8. ENGINE SECONDARY IGNITION CHECK - must exhibit a normal scope pattern <p>Always look for any Technical Service Bulletins that may relate to this condition</p> <p>Checking Distributor Position with DRB (V8 only). Connect the DRB to the Data Link Connector and select the set SYNC from the menu.</p> <p>Warning: The following test will be performed with the engine running: avoid contact with rotating components.</p> <p>Start the engine and observe the DRB display. When the distributor is correctly positioned, the IN RANGE message should appear along with 0 degrees.</p> <p>If the distributor needs to be adjusted, loosen the distributor hold-down clamp bolt. Rotate the distributor until reading is as close to 0 degrees as possible and the IN RANGE message is displayed. Tighten clamp bolt to 22.5 N.m (200 in. lbs.) torque.</p> <p>Note: Setting the distributor position does not adjust the ignition timing. Ignition timing values are determined by the Powertrain Control Module.</p> <p>Test Complete.</p>	All
1108	<p>Ignition Off</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Note: The following steps are checking for a short between the Driver Circuits.</p> <p>Using an Ohmmeter measure the resistance between the IAC #1 Driver and #2, #3, #4 Drivers.</p> <p>Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1109</p>	All

*** CHECKING IAC MOTOR — Continued**

TEST	ACTION	APPLICABILITY
1109	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #2 Driver and #3, #4 Drivers. Is the resistance below 5.0 ohms on any of the Drivers?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1110</p>	All
1110	<p>Ignition Off Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Note: The following steps are checking for a short between the Driver Circuits. Using an Ohmmeter, measure the resistance between the IAC #3 Driver and #4 Driver. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the IAC Driver Circuits, shorted together. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1111</p>	All
1111	<p>If there are no potential causes remaining, the Idle Air Control Motor is assumed to be defective. View repair options.</p> <p>Repair Replace the Idle Air Control Motor. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** CHECKING MECHANICAL SYSTEM**

POSSIBLE CAUSES
ENGINE COMPRESSION NOT WITHIN SPECIFICATIONS
EXHAUST SYSTEM RESTRICTED
POWERTRAIN CONTROL MODULE DEFECTIVE
SPARK PLUG CABLES NOT PROPERLY INSTALLED
VALVE TIMING NOT WITHIN SPECIFICATIONS

*** CHECKING MECHANICAL SYSTEM — Continued**

TEST	ACTION	APPLICABILITY
1112	<p>Engine Running Check the Exhaust System for any restrictions. Is the Exhaust free of any restrictions?</p> <p>Yes → Go To 1113</p> <p>No → Repair as necessary. Perform Powertrain Verification Test VER-1A.</p>	All
1113	<p>Ignition Off Inspect Spark Plug Cables for correct placement. Are Spark Plug Cables positioned correctly?</p> <p>Yes → Go To 1114</p> <p>No → Reinstall Spark Plug Cables as necessary. Perform Powertrain Verification Test VER-1A.</p>	All
1114	<p>Ignition Off Using the service manual procedures, check the Valve Timing. Is the Valve Timing within specifications?</p> <p>Yes → Go To 1115</p> <p>No → Repair the Engine Valve Timing as necessary. Perform Powertrain Verification Test VER-1A.</p>	All
1115	<p>Ignition Off Remove the ASD Relay. Note: Check connectors - Clean/repair as necessary. Remove the Spark Plugs. Using service manual procedures, check engine compression. Is the engine compression within specifications?</p> <p>Yes → Go To 1116</p> <p>No → Repair as necessary. Perform Powertrain Verification Test VER-1A.</p>	All
1116	<p>If there are no potential causes or DTC's remaining, the Powertrain Control Module is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** ENGINE CRANKS DOES NOT START**

POSSIBLE CAUSES
ASD RELAY OUTPUT CIRCUIT OPEN
ENGINE VALVE TIMING NOT WITHIN SPECIFICATIONS
DISTRIBUTOR CAP, ROTOR OR CABLES DEFECTIVE
DISTRIBUTOR DRIVE SYSTEM DEFECTIVE
IGNITION COIL DRIVE CIRCUIT OPEN
IGNITION COIL DRIVE CIRCUIT SHORT TO GROUND
PCM DEFECTIVE
COIL SECONDARY CABLE DEFECTIVE
IGNITION COIL CONNECTOR TERMINAL OBSERVABLE DEF
IGNITION COIL DEFECTIVE (PRIMARY TERMINALS)
IGNITION COIL DEFECTIVE (SECONDARY TERMINALS)

*** ENGINE CRANKS DOES NOT START — Continued**

TEST	ACTION	APPLICABILITY
1117	Ignition Off Disconnect the Spark Plug Cable at Spark Plug #1. Note: Check connectors - Clean/repair as necessary. Connect the Cable to a Spark Tester. Connect the Spark Tester to a good ground. While cranking the engine for 10 seconds, watch for spark. Is there a good spark? Yes → Go To 1118 No → Go To 1119	All
1118	Note: If PCM was changed, the vehicle theft or skim may cause this. Update PCM. Does the vehicle start and stall? Yes → Refer to symptom * CHECKING THE IDLE AIR CONTROL MOTOR in the DRIVEABILITY category. No → Refer to symptom * CHECKING FUEL SYSTEM in the STARTING category.	All
1119	Ignition Off Check Valve Timing. See pertinent service information for instructions. Is the Timing within specifications? Yes → Go To 1120 No → Repair the Engine Valve Timing as necessary. Perform Powertrain Verification Test VER-1A.	All
1120	Ignition Off Remove the Coil Secondary Cable from the Distributor. Note: Check connectors - Clean/repair as necessary. Connect the Cable to a Spark Tester. Connect the Spark Tester to a good ground. While cranking the Engine for 10 seconds, watch for spark. Is there good spark? Yes → Repair the Secondary Ignition: Distributor Cap, Rotor, Cables. Perform Powertrain Verification Test VER-1A. No → Go To 1121	All
1121	Ignition Off Remove the Distributor Cap. While cranking the engine, watch for the Rotor to turn. Did the Rotor turn when the engine was cranked? Yes → Go To 1122 No → Repair the Distributor Drive System. Perform Powertrain Verification Test VER-1A.	All

STARTING

* ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
1122	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Inspect all Terminals. Is any Terminal damaged, pushed out, or miswired?</p> <p>Yes → Repair Terminal(s) for damage, pushed out, or miswiring. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1123</p>	All
1123	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on, with the engine off. With DRB, actuate the Ignition Coil. Using a Voltmeter, measure the ASD Relay Output Circuit in the Ignition Coil Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1124</p> <p>No → Repair the open ASD Relay Output Circuit from Coil Connector to splice. Perform Powertrain Verification Test VER-1A.</p>	All
1124	<p>Ignition Off Disconnect the PCM Black Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Ignition Coil Driver Circuit at the PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Ignition Coil Driver Circuit for a short to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1125</p>	All
1125	<p>Ignition Off Remove the Coil Secondary Cable. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Coil Secondary Cable. Is the resistance above 15K ohms?</p> <p>Yes → Replace the Coil Secondary Cable. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1126</p>	All
1126	<p>Ignition Off Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the Primary Terminals of the Ignition Coil. Is the Primary resistance between 0.95 and 1.20 ohms?</p> <p>Yes → Go To 1127</p> <p>No → Replace the Ignition Coil (Primary Terminals). Perform Powertrain Verification Test VER-1A.</p>	All

* ENGINE CRANKS DOES NOT START — Continued

TEST	ACTION	APPLICABILITY
1127	<p>Ignition Off Remove the Coil Secondary Cable. Note: Check connectors - Clean/repair as necessary. Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the Primary and Secondary Terminals of the Coil. Is the Secondary resistance between 11,300 - 15,300 ohms?</p> <p>Yes → Go To 1128</p> <p>No → Replace the Ignition Coil (Secondary Terminals). Perform Powertrain Verification Test VER-1A.</p>	All
1128	<p>Ignition Off Disconnect the PCM Black Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the Coil Driver Circuit from the Ignition Coil to the PCM Connector. Is the resistance above 5.0 ohms?</p> <p>Yes → Repair open Ignition Coil Driver from PCM to Coil Connector. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1129</p>	All
1129	<p>Ignition Off If there are no potential causes remaining, the PCM is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the PCM. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE**

POSSIBLE CAUSES

"NO RESPONSE" DISPLAYED
ASD RELAY OUTPUT CIRCUIT SHORTED TO GROUND
DRB ADAPTER CABLE DEFECTIVE
FUSED IGNITION SWITCH OUTPUT CIRCUIT OPEN
IGNITION COIL DEFECTIVE
PCM 5-VOLT PRIMARY SUPPLY CIRCUIT SHORTED TO GND
PCM 5-VOLT SECONDARY SUPPLY CIRCUIT SHORTED TO GND
TPS GROUND CIRCUIT SHORTED TO VOLTAGE
CAMSHAFT POSITION SENSOR DEFECTIVE
CRANKSHAFT POSITION SENSOR DEFECTIVE
FUEL INJECTOR(S) DEFECTIVE
GENERATOR SHORTED TO GROUND
OIL PRESSURE SENDING UNIT DEFECTIVE
SCI RECEIVE CIRCUIT OPEN
SCI RECEIVE CIRCUIT SHORTED TO GROUND
SCI TRANSMIT CIRCUIT OPEN
SCI TRANSMIT CIRCUIT SHORTED TO GROUND
DRB DEFECTIVE
MANIFOLD ABSOLUTE PRESSURE SENSOR DEFECTIVE
O2 SENSOR(S) DEFECTIVE
PCM DEFECTIVE (NO RESPONSE)
PCM GROUND CIRCUIT(S) OPEN
POWERTRAIN CONTROL MODULE DEFECTIVE (NS-6D)
VEHICLE SPEED SENSOR DEFECTIVE
FUSED B(+) CIRCUIT OPEN BETWEEN FUSE/BATTERY
FUSED B(+) CIRCUIT SHORTED TO GROUND
FUSED B(+) CIRCUIT OPEN BETWEEN FUSE/PCM
LEAK DETECTION PUMP DEF

*** ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE —**
Continued

TEST	ACTION	APPLICABILITY
1130	<p>Key off. Disconnect the Powertrain Control Module Black Connector. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure both Ground Circuits at PCM Connector. Is the resistance below 5.0 ohms at both Terminals?</p> <p>Yes → Go To 1131</p> <p>No → Repair the open ground(s) at the Powertrain Control Module. Perform Powertrain Verification Test VER-1A.</p>	All
1131	<p>Key off. Disconnect the Powertrain Control Module Black Connector. Note: Check connectors - Clean/repair as necessary. Turn ignition on. Using a Voltmeter, measure the Fused Ignition Switch Output Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1132</p> <p>No → Repair the open Fused Ignition Switch Output Circuit between PCM & Ignition Switch. Perform Powertrain Verification Test VER-1A.</p>	All
1132	<p>Key off. Disconnect the Powertrain Control Module Black Connector. Note: Check connectors - Clean/repair as necessary. With a Voltmeter, measure the Fused B(+) Circuit in the PCM Connector. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1133</p> <p>No → Go To 1142</p>	All
1133	<p>Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Ignition key on. Connect a Voltmeter to the Throttle Position Sensor 5-Volt Supply Circuit. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1134</p> <p>No → Replace the Powertrain Control Module. Perform Powertrain Verification Test VER-1A.</p>	All
1134	<p>Ignition Off Disconnect the Camshaft Sensor. Note: Check connectors - Clean/repair as necessary. Ignition key on. Connect a Voltmeter to the Camshaft Position Sensor 5-Volt Supply Circuit. Read Voltmeter. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1135</p> <p>No → Replace the Camshaft Sensor. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

* ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE — Continued

TEST	ACTION	APPLICABILITY
1135	<p>Ignition Off Disconnect the Crankshaft Sensor. Note: Check connectors - Clean/repair as necessary. Ignition key on. Connect a Voltmeter to the Crankshaft Position Sensor 5-volt Supply Circuit. Read Voltmeter. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1136</p> <p>No → Replace the Crankshaft Sensor. Perform Powertrain Verification Test VER-1A.</p>	All
1136	<p>Ignition Off Disconnect the MAP Sensor. Note: Check connectors - Clean/repair as necessary. Ignition key on. Connect a Voltmeter to the Manifold Absolute Pressure Sensor 5-Volt Supply Circuit. Read Voltmeter. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1137</p> <p>No → Replace the MAP Sensor. Perform Powertrain Verification Test VER-1A.</p>	All
1137	<p>Ignition Off Disconnect the Vehicle Speed Sensor. Note: Check connectors - Clean/repair as necessary. Ignition key on. Connect a Voltmeter to the Vehicle Speed Sensor 5-Volt Supply Circuit. Read the Voltmeter. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1138</p> <p>No → Replace the Vehicle Speed Sensor. Perform Powertrain Verification Test VER-1A.</p>	All
1138	<p>Ignition Off Disconnect the Oil Pressure Sending unit. Note: Check connectors - Clean/repair as necessary. Read the voltmeter. Is the voltage below 4.0 volts?</p> <p>Yes → Go To 1139</p> <p>No → Replace the Oil Pressure Sending unit.</p>	All
1139	<p>Ignition Off Disconnect the Throttle Position Sensor. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running. Measure the voltage of the Sensor Ground Circuit at TPS Connector. Is the voltage above 1.0 volt?</p> <p>Yes → Repair the Sensor Ground Circuit shorted to voltage. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1140</p>	All

*** ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE —**
Continued

TEST	ACTION	APPLICABILITY
1140	<p>Ignition Off</p> <p>Disconnect the Throttle Position Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Camshaft Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Crankshaft Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the MAP Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Vehicle Speed Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Oil Pressure Sending Unit.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>With an Ohmmeter, measure the resistance of the 5-Volt Primary Supply Circuit to ground at the Powertrain Control Module Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the shorted 5-Volt Primary Supply shorted to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1141</p>	All
1141	<p>Ignition Off</p> <p>Disconnect the Throttle Position Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Camshaft Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Crankshaft Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the MAP Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Vehicle Speed Sensor.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Oil Pressure Sending Unit.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Powertrain Control Module.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With an Ohmmeter, measure the resistance of the 5-Volt Secondary Supply Circuit to ground at the Powertrain Control Module Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the shorted 5-Volt Secondary Supply shorted to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1152</p>	All
1142	<p>Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22.</p> <p>Inspect the Fuse.</p> <p>Is the Fuse OK?</p> <p>Yes → Go To 1143</p> <p>No → Go To 1144</p>	All

STARTING

* ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE — Continued

TEST	ACTION	APPLICABILITY
1143	<p>Remove the fuse in the PDC that supplies Fused B (+) to PCM Cavity A22. Using a Voltmeter, measure the B (+) side of the Fuse Socket. Is the voltage above 10.0 volts?</p> <p>Yes → Repair the open Fused B(+) Circuit from Fuse to PCM. Perform Powertrain Verification Test VER-1A.</p> <p>No → Repair the open B(+) Circuit from Fuse to the Battery. Perform Powertrain Verification Test VER-1A.</p>	All
1144	<p>Turn ignition off. Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the Auto Shutdown Relay. With an Ohmmeter, measure the Fused B(+) Circuit in PCM Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the Fused B(+) Circuit for a short to ground. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1145</p>	All
1145	<p>Ignition Off Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the ASD Relay. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the ASD Relay Output Circuit resistance in the ASD Relay Connector to ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1146</p> <p>No → Go To 1152</p>	All
1146	<p>Turn ignition off. Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Connectors for each Oxygen Sensor. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the ASD Relay Output Circuit for resistance to ground. Continue to monitor the Ohmmeter display while disconnecting each Fuel Injector. Is the resistance above 5.0 ohms when any of the Injectors are disconnected?</p> <p>Yes → Go To 1147</p> <p>No → Repair ASD Relay Output Circuit for Harness short to ground. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p>	All

* ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE — Continued

TEST	ACTION	APPLICABILITY
1147	<p>Disconnect all oxygen sensors. Note: Check connectors - Clean/repair as necessary. Disconnect the Generator Field connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Leak Detection Pump connector. Note: Check connectors - Clean/repair as necessary. Using an ohmmeter, measure the resistance of the ASD relay output circuit to ground. Is the resistance above 5.0 ohms?</p> <p>Yes → Replace the Leak Detection Pump. Replace the Fuse. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1148</p>	All
1148	<p>Turn ignition off. Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Connectors for each Oxygen Sensor. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the ASD Relay Output Circuit for resistance to ground. Is the resistance above 5.0 ohms?</p> <p>Yes → Measure the ASD Relay Output Circuit in each O2 Sensor for resistance to ground. Replace the O2 Sensor that has continuity to ground. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1149</p>	All
1149	<p>Turn ignition off. Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Connectors for each Oxygen Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the ASD Relay Output Circuit for resistance to ground. Is the resistance above 5.0 ohms?</p> <p>Yes → Replace the Ignition Coil. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1150</p>	All

STARTING

* ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE — Continued

TEST	ACTION	APPLICABILITY
1150	<p>Turn ignition off. Remove the Fuse in the PDC that supplies Fused B(+) to PCM Cavity A22. Disconnect the Auto Shutdown Relay. Note: Check connectors - Clean/repair as necessary. Disconnect the Connectors for each Oxygen Sensor. Note: Check connectors - Clean/repair as necessary. Disconnect the Ignition Coil Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Generator Field Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the ASD Relay Output Circuit for resistance to ground. Is the resistance above 5.0 ohms?</p> <p>Yes → Repair Generator for a short to ground. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1151</p>	All
1151	<p>If there are no potential causes remaining, the Fuel Injector is assumed to be shorted to ground. View repair options.</p> <p>Repair</p> <p>Replace the Fuel Injector that caused a change in resistance. Replace Fuse. Perform Powertrain Verification Test VER-1A.</p>	All
1152	<p>With the DRB, attempt to read trouble codes. Was the ignition on when the "NO RESPONSE" message was displayed?</p> <p>Yes → Go To 1153</p> <p>No → Turn ignition on to get a response.</p>	All
1153	<p>Connect the DRB to a functional Data Link on another vehicle. Turn Ignition on. With the DRB, attempt to read trouble codes. Did the DRB display "No Response"?</p> <p>Yes → Go To 1154</p> <p>No → Replace the initial vehicle's PCM. Perform Powertrain Verification Test VER-1A.</p>	All
1154	<p>Substitute another DRB adapter cable. With the DRB, attempt to read trouble codes. Did the DRB display "No Response"?</p> <p>Yes → Go To 1155</p> <p>No → Replace the DRB Adapter Cable. Perform Powertrain Verification Test VER-1A.</p>	All

* **ENGINE DOES NOT START & DRB DISPLAYS NO RESPONSE —**
Continued

TEST	ACTION	APPLICABILITY
1155	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the SCI Receive Circuit from the PCM to the DLC. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1156</p> <p>No → Repair the open SCI Receive Circuit. Perform Powertrain Verification Test VER-1A.</p>	All
1156	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the SCI Receive Circuit and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the SCI Receive Circuit for a short to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1157</p>	All
1157	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the SCI Transmit Circuit from the PCM to the DLC. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1158</p> <p>No → Repair the open SCI Transmit Circuit. Perform Powertrain Verification Test VER-1A.</p>	All
1158	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the SCI Transmit Circuit and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the SCI Transmit Circuit for a short to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1159</p>	All
1159	<p>If there are no potential causes remaining, the DRB is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Have the DRB repaired or replaced. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** ENGINE STARTS & DRB DISPLAYS "NO RESPONSE"**

POSSIBLE CAUSES
DRB ADAPTER CABLE DEFECTIVE
DRB DEFECTIVE
PCM DEFECTIVE (NO RESPONSE)
SCI RECEIVE CIRCUIT OPEN
SCI RECEIVE CIRCUIT SHORTED TO GROUND
SCI TRANSMIT CIRCUIT OPEN
SCI TRANSMIT CIRCUIT SHORTED TO GROUND

* ENGINE STARTS & DRB DISPLAYS "NO RESPONSE" — Continued

TEST	ACTION	APPLICABILITY
1160	<p>Connect the DRB to a functional Data Link on another vehicle. Turn Ignition on. With the DRB, attempt to read trouble codes. Did the DRB display "No Response"?</p> <p>Yes → Go To 1161</p> <p>No → Replace the initial vehicle's PCM. Perform Powertrain Verification Test VER-1A.</p>	All
1161	<p>Substitute another DRB adapter cable. With the DRB, attempt to read trouble codes. Did the DRB display "No Response"?</p> <p>Yes → Go To 1162</p> <p>No → Replace the DRB Adapter Cable. Perform Powertrain Verification Test VER-1A.</p>	All
1162	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the SCI Receive Circuit from the PCM to the DLC. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1163</p> <p>No → Repair the open SCI Receive Circuit. Perform Powertrain Verification Test VER-1A.</p>	All
1163	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the SCI Receive Circuit and ground. Is the resistance below 5.0 ohms?</p> <p>Yes → Repair the SCI Receive Circuit for a short to ground. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1164</p>	All
1164	<p>Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance of the SCI Transmit Circuit from the PCM to the DLC. Is the resistance below 5.0 ohms?</p> <p>Yes → Go To 1165</p> <p>No → Repair the open SCI Transmit Circuit. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

* ENGINE STARTS & DRB DISPLAYS "NO RESPONSE" — Continued

TEST	ACTION	APPLICABILITY
1165	Key off. Disconnect the Powertrain Control Module. Note: Check connectors - Clean/repair as necessary. Using an Ohmmeter, measure the resistance between the SCI Transmit Circuit and ground. Is the resistance below 5.0 ohms? Yes → Repair the SCI Transmit Circuit for a short to ground. Perform Powertrain Verification Test VER-1A. No → Go To 1166	All
1166	If there are no potential causes remaining, the DRB is assumed to be defective. View repair options. Repair Have the DRB repaired or replaced. Perform Powertrain Verification Test VER-1A.	All

Symptom:*** ENGINE WILL NOT CRANK**

POSSIBLE CAUSES
BATTERY CIRCUIT RESISTANCE TOO HIGH
FUSED B(+) CIRCUIT OPEN
FUSED B(+) CIRCUIT OPEN
IGNITION SWITCH OUTPUT CIRCUIT OPEN
IGNITION SWITCH OUTPUT CIRCUIT OPEN
PARK/NEUTRAL SWITCH SENSE CIRCUIT OPEN
STARTER RELAY GROUND CIRCUIT OPEN
STARTER RELAY OUTPUT CIRCUIT OPEN
STARTER MOTOR DEFECTIVE
STARTER RELAY DEFECTIVE
STARTER RELAY DEFECTIVE
STARTER SOLENOID DEFECTIVE

STARTING

* ENGINE WILL NOT CRANK — Continued

TEST	ACTION	APPLICABILITY
1167	<p>Is the Vehicle equipped with a manual transmission?</p> <p>Yes → If TRANSMISSION - MANUAL 5-SPEED, Go To 1168 Else, Test Complete.</p> <p>No → Go To 1177</p>	TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW
1168	<p>Ignition Off Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. Warning: The Parking Brake must be on and the Transmission must be in park for a vehicle equipped with an automatic transmission or in neutral for a vehicle equipped with a manual transmission. Warning: The engine may be cranked in the next step. Keep away from moving engine parts. Briefly connect a jumper wire between Starter Rly B(+) and Output Circuits. Did the Starter Motor crank the engine?</p> <p>Yes → Go To 1169</p> <p>No → Go To 1173</p>	TRANSMISSION - MANUAL 5-SPEED
1169	<p>Ignition Off Disconnect the Starter Relay. Note: Check connectors - Clean/repair as necessary. With a Voltmeter, measure the Fused B(+) Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1170</p> <p>No → Repair the open Fused B(+) Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - MANUAL 5-SPEED
1170	<p>Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running With a Voltmeter, measure the Ignition Switch Output Circuit. While observing Voltmeter, hold ignition key in the run position and depress Clutch Pedal. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1171</p> <p>No → Repair the open Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - MANUAL 5-SPEED
1171	<p>Ignition Off Disconnect the Starter Relay. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the Starter Relay P/N Sense Ckt. Is the resistance above 5.0 ohms?</p> <p>Yes → Repair the open Starter Relay Ground Circuit. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1172</p>	TRANSMISSION - MANUAL 5-SPEED

* ENGINE WILL NOT CRANK — Continued

TEST	ACTION	APPLICABILITY
1172	<p>If there are no potential caused remaining, the Starter Relay is assumed to be defective. View repair options.</p> <p>Repair</p> <p>Replace the Starter Relay. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - MANUAL 5-SPEED
1173	<p>Ignition Off</p> <p>Check the Battery Cables for high resistance. (Use service procedure) Did either Battery Circuit have a voltage drop greater than 0.2 volt?</p> <p>Yes → Repair the Battery Circuit for high resistance. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1174</p>	All
1174	<p>Ignition Off</p> <p>Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. Disconnect the Starter Relay Output Wire from the Starter Solenoid. Note: Check connectors - Clean/repair as necessary. Measure the resistance of the Starter Relay Output Circuit from the Relay to the Solenoid Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → If TRANSMISSION - MANUAL 5-SPEED, Go To 1175 Else, Go To 1184</p> <p>No → Repair open Starter Relay Output Ckt. Perform Powertrain Verification Test VER-1A.</p>	All
1175	<p>Ignition Off</p> <p>Disconnect the Starter Relay. Note: Check connectors - Clean/repair as necessary. With a Voltmeter, measure the Fused B(+) Circuit. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1176</p> <p>No → Repair the open Fused B(+) Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - MANUAL 5-SPEED
1176	<p>Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. Ignition On, Engine Not Running With a Voltmeter, measure the Ignition Switch Output Circuit. While observing Voltmeter, hold ignition key in the run position and depress Clutch Pedal. Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1184</p> <p>No → Repair the open Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - MANUAL 5-SPEED

STARTING

* ENGINE WILL NOT CRANK — Continued

TEST	ACTION	APPLICABILITY
1177	<p>Ignition On, Engine Not Running Ensure Transmission is in Park. With the DRB, select the Inputs/Outputs and read the Park/Neutral position. Does the DRB read P/N?</p> <p>Yes → Go To 1178</p> <p>No → Refer to symptom P-1899 P/N SWITCH STUCK IN PARK OR IN GEAR in the DRIVEABILITY category.</p>	<p>TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW</p>
1178	<p>Ignition Off Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. Warning: The Parking Brake must be on and the Transmission must be in park for a vehicle equipped with an automatic transmission or in neutral for a vehicle equipped with a manual transmission. Warning: The engine may be cranked in the next step. Keep away from moving engine parts. Briefly connect a jumper wire between Starter Rly B(+) and Output Circuits. Did the Starter Motor crank the engine?</p> <p>Yes → Go To 1179</p> <p>No → Go To 1180</p>	<p>TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW</p>
1179	<p>Ignition Off Disconnect the Starter Relay Connector. Note: Check connectors - Clean/repair as necessary. With an Ohmmeter, measure the P/N Position Switch Sense Circuit to Ground in the Starter Relay Connector. Is the resistance below 5.0 ohms?</p> <p>Yes → Replace the Starter Relay. Perform Powertrain Verification Test VER-1A.</p> <p>No → Repair the open Park/Neutral Switch Sense Circuit between Starter Relay and splice. Perform Powertrain Verification Test VER-1A.</p>	<p>TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW</p>
1180	<p>Ignition Off Check the Battery Cables for high resistance. (Use service procedure) Did either Battery Circuit have a voltage drop greater than 0.2 volt?</p> <p>Yes → Repair the Battery Circuit for high resistance. Perform Powertrain Verification Test VER-1A.</p> <p>No → Go To 1181</p>	All

* ENGINE WILL NOT CRANK — Continued

TEST	ACTION	APPLICABILITY
1181	<p>Ignition Off</p> <p>Disconnect the Starter Relay Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Disconnect the Starter Relay Output Wire from the Starter Solenoid.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Measure the resistance of the Starter Relay Output Circuit from the Relay to the Solenoid Connector.</p> <p>Is the resistance below 5.0 ohms?</p> <p>Yes → If TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW, Go To 1182 Else, Go To 1184</p> <p>No → Repair open Starter Relay Output Ckt. Perform Powertrain Verification Test VER-1A.</p>	All
1182	<p>Ignition Off</p> <p>Disconnect the Starter Relay Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>With a Voltmeter, measure the Fused B(+) Circuit at the Starter Relay.</p> <p>Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1183</p> <p>No → Repair the open Fused B(+) Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW
1183	<p>Disconnect the Starter Relay Connector.</p> <p>Note: Check connectors - Clean/repair as necessary.</p> <p>Ignition On, Engine Not Running</p> <p>With a Voltmeter, measure the Ignition Switch Output Circuit at the Starter Relay Connector.</p> <p>While observing Voltmeter, hold ignition key in the start position.</p> <p>Is the voltage above 10.0 volts?</p> <p>Yes → Go To 1184</p> <p>No → Repair the open Ignition Switch Output Circuit. Perform Powertrain Verification Test VER-1A.</p>	TRANSMISSION - AUTOMATIC 3-SPEED and/or TRANSMISSION - AUTOMATIC 4-SPD, AW
1184	<p>Did the Starter Solenoid click when the jumper wire was previously connected?</p> <p>Yes → Repair the mechanical condition preventing the Starter Motor from cranking. Perform Powertrain Verification Test VER-1A.</p> <p>No → Replace the Starter Solenoid. Perform Powertrain Verification Test VER-1A.</p>	All

STARTING

Symptom:

*** LOW FUEL PRESSURE**

POSSIBLE CAUSES
FUEL LINES RESTRICTED
FUEL PUMP MODULE DEF

*** LOW FUEL PRESSURE — Continued**

TEST	ACTION	APPLICABILITY
1185	Ignition Off Inspect the Fuel Lines from Tank to Fuel Rail for restriction. Are there any restrictions? Yes → Repair restricted Fuel Lines. Perform Powertrain Verification Test VER-1A. No → Go To 1186	All
1186	If there are no potential causes remaining, the Fuel Pump Module is assumed to be defective. View repair options. Repair Replace the Fuel Pump Module. Perform Powertrain Verification Test VER-1A.	All

STARTING

Symptom:

* REPAIRING A START AND STALL CONDITION

TEST	ACTION	APPLICABILITY
1187	<p>If PCM has been changed and correct VIN & mileage haven't been programmed, a DTC will be set in ABS & Air bag modules. In addition, if vehicle is equipped with a Smart Key Immobilizer Module (SKIM), Secret Key data must be updated to enable starting.</p> <p>For ABS and Air Bag systems: ACTION: Enter correct VIN and mileage in PCM. Erase codes in ABS and Air Bag modules.</p> <p>For SKIM Theft alarm: ACTION: Connect the DRB to the data link connector. Go to Engine, Misc. and place the SKIM in secured access mode, by using the appropriate PIN code for this vehicle.</p> <p>Select Update the Secret Key data, data will be transferred from the SKIM to the PCM.</p> <p>At this point in the diagnostic test procedure, you have determined that all of the engine electrical systems are operating as designed; therefore, they are not the cause of the start and stall problem.</p> <p>The following additional items should be checked as possible mechanical causes of the no start condition. Any one or more of these items can produce a no start condition; none can be overlooked as a possible cause.</p> <ol style="list-style-type: none"> 1. DISTRIBUTOR POSITION - must be within specifications* 2. ENGINE VALVE TIMING - must be within specifications 3. ENGINE COMPRESSION - must be within specifications 4. ENGINE EXHAUST - must be free of any restrictions 5. ENGINE PCV SYSTEM - must flow freely 6. ENGINE DRIVE SPROCKETS - must be properly positioned 7. FUEL - must be free of contamination 8. ENGINE SECONDARY IGNITION CHECK - must exhibit a normal scope pattern <p>Always look for any Technical Service Bulletins that may relate to this condition</p> <p>Checking Distributor Position with DRB (V8 only). Connect the DRB to the Data Link Connector and select the set SYNC from the menu.</p> <p>Warning: The following test will be performed with the engine running: avoid contact with rotating components.</p> <p>Start the engine and observe the DRB display. When the distributor is correctly positioned, the IN RANGE message should appear along with 0 degrees.</p> <p>If the distributor needs to be adjusted, loosen the distributor hold-down clamp bolt. Rotate the distributor until reading is as close to 0 degrees as possible and the IN RANGE message is displayed. Tighten clamp bolt to 22.5 N.m (200 in. lbs.) torque.</p> <p>Note: Setting the distributor position does not adjust the ignition timing. Ignition timing values are determined by the Powertrain Control Module.</p> <p>Test Complete.</p>	All

Verification Tests

AW4 ELEC TRANSAXLE VER-1A TEST	APPLICABILITY
<p>1. Leave the DRB connected to the Data Link Connector (DLC). Reconnect any disconnected components. With the DRB, erase all Trouble Codes.</p> <p>2. With the DRB, display Engine Temperature. Start and run the engine until the Engine Temperature is HOT (above 180 deg. F) CHECK THE TRANSMISSION FLUID. ADJUST IF NECESSARY.</p> <p>3. Road test the vehicle. With the DRB, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 55 MPH with a constant throttle opening of 20 to 25 degrees.</p> <p>4. Below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown.</p> <p>5. Check for Trouble Codes after the road test.</p> <p>Were any Trouble Codes set during the road test ?</p> <p>Yes → Refer to Symptom List for appropriate diagnostic tests. Perform Transmission Verification Test VER-1A</p> <p>No → Repair is not complete, refer to appropriate symptom.</p>	All

VERIFICATION TEST VER-1A	APPLICABILITY
<p>1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start.</p> <p>2. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules.</p> <p>3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode, by using the appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM.</p> <p>4. Inspect the vehicle to ensure that all engine components are connected. Reassemble and reconnect components as necessary. Inspect the engine for contamination. If it is contaminated, change the oil and filter.</p> <p>5. Attempt to start the engine.</p> <p>6. If the engine is unable to start, look for any Technical Service Bulletins that may relate to this condition. Return to Symptom List if necessary.</p> <p>7. If the engine starts and stays running, the repair is now complete.</p>	All

VERIFICATION TESTS

Verification Tests — Continued

VERIFICATION TEST VER-2A	APPLICABILITY
<p>1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start.</p> <p>2. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules.</p> <p>3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode, by using the appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM.</p> <p>4. Inspect the vehicle to ensure that all engine components are connected.</p> <p>5. If there are any diagnostic trouble codes that have not been repaired, go to the Symptom List and follow the path specified. After all diagnostic trouble codes have been repaired, return to the appropriate Verification Test.</p> <p>6. If this verification procedure is being performed after a NO TROUBLE CODE test, do the following: Check to see if the initial symptom still exists.</p> <p>7. If the initial or another symptom exists, the repair is not complete. Check all technical service bulletins or flash updates and return to Symptom list if necessary.</p> <p>8. Connect the DRB to the data link connector. Using the DRB erase any diagnostic trouble codes and reset all values.</p> <p>9. Road test vehicle, use all accessories that may be related to this repair.</p> <p>10. If the repaired trouble code or symptom was seen while on the road test, the repair is not complete. Check for any technical service bulletins or flash updates and return to the appropriate Symptom list.</p> <p>11. If another trouble code has set, go to Symptom List and follow the path specified for that trouble code. If there are no trouble codes or the symptom no longer exists, the repair was successful and is now complete.</p> <p>Was this test performed after an OBDII trouble code test?</p> <p>Yes → Repair is not complete, refer to appropriate symptom.</p> <p>No → Repair is complete.</p>	All

VERIFICATION TEST VER-3A	APPLICABILITY
<p>1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start.</p> <p>2. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules.</p> <p>3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc. and place the SKIM in secured access mode, by using appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM.</p> <p>4. Inspect the vehicle to ensure that all engine components are connected. Reassemble and reconnect components as necessary.</p> <p>5. Connect the DRB to the Data Link Connector and erase the codes.</p> <p>6. Ensure no other charging system problems remain by doing the following: Start the engine. Perform generator output per service manual.</p> <p>7. Raise the engine speed to 2000 rpm for at least 30 seconds.</p> <p>8. Allow the engine to idle.</p> <p>9. Turn the engine off.</p> <p>10. Turn the ignition key on.</p> <p>11. With the DRB, read trouble code messages.</p> <p>12. If repaired code has reset, or any other one has set, check all pertinent Technical Service Bulletins and return to Symptom List if necessary.</p> <p>13. If there are no codes, the repair is now complete.</p>	All

Verification Tests — Continued

VERIFICATION TEST VER-4A	APPLICABILITY
<ol style="list-style-type: none"> 1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start. 2. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules. 3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode, by using the appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM. 4. Inspect the vehicle to ensure that all engine components are connected. Reassemble and reconnect components as necessary. 5. Connect the DRB to the data link connector and erase all codes. 6. Ensure no other speed control problems remain by doing the following: Road test the vehicle at a speed above 35 mph. 7. Turn the speed control ON (if equipped, cruise light will be on). 8. Depress and release the SET Switch. If the speed control did not engage, the repair is not complete.* 9. Depress and hold the RESUME/ACCEL Switch. If the vehicle speed did not increase by at least 2 mph, the repair is not complete.* 10. Press and hold the COAST switch. The vehicle speed should decrease. If it did not decrease, the repair is not complete.* 11. Using caution, depress and release the brake pedal. If the speed control did not disengage, the repair is not complete. 12. Bring the vehicle speed back up to 35 MPH. 13. Depress the RESUME/ACCEL switch. If the speed control did not resume the previously set speed, the repair is not complete.* 14. Hold down the SET switch. If the vehicle did not decelerate, the repair is not complete. 15. Ensure the vehicle speed is greater than 35 mph and release the SET Switch. If vehicle did not adjust and set a new vehicle speed, the repair is not complete.* 16. Depress and release the CANCEL switch. If the speed control did not disengage, the repair is not complete.* 17. Bring the vehicle speed back up above 35 mph and engage speed control. 18. Depress the OFF switch to turn OFF, (Cruise light will be off). If the speed control did not disengage, the repair is not complete.* 19. If the vehicle successfully passed all of the previous tests, the speed control system is now functioning as designed. The repair is now complete. 20. * Check for Technical Service Bulletins that pertain to speed control problem and then, if necessary, return to Symptom List. 	<p style="text-align: center;">All</p>

VERIFICATION TESTS

Verification Tests — Continued

VERIFICATION TEST VER-5A	APPLICABILITY
<ol style="list-style-type: none"> 1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start. 2. For ABS and Air Bag systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules. 3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc. and place SKIM in secured access mode, by using the appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM. 4. Inspect the vehicle to ensure all engine components are connected. 5. If any existing diagnostic trouble codes have not been repaired, go to Symptom List and follow path specified. After all diagnostic trouble codes have been repaired, return to TEST VER-5A and run appropriate monitor for previously repaired OBDII codes. 6. Connect the DRB to the data link connector. 7. Ensure the fuel tank has at least a quarter tank of fuel. Turn off all accessories. 8. The proper way to verify an OBDII Trouble Code repair is to allow Powertrain Control Module (PCM) to run appropriate monitor(s) and increment appropriate good trip. The technician can see monitor using the DRBIII. 9. The enabling conditions must be met before the PCM will run the monitor. Read the enabling conditions on the DRBIII monitor Pre-test screens. 10. With the DRBIII, monitor the pre-test enabling conditions until all conditions have been met. Once the conditions have been met, switch screen to the appropriate OBDII monitor, (Audible beeps when the monitor is running). 11. If the repaired OBDII trouble code has reset or was seen in the monitor while on the road test, the repair is not complete. Check for any related technical service bulletins or flash updates and return to Symptom List. 12. If another trouble code has set, return to Symptom List and follow the path specified for that trouble code. 13. If the monitor ran, the good trip counter incremented and there are no new trouble codes, the repair was successful and is now complete. Erase any diagnostic trouble codes. 	ENGINE - 4.0L I-6,

VERIFICATION TEST VER-5A2	APPLICABILITY
<ol style="list-style-type: none"> 1. With the DRB III, monitor the Similar Conditions to attempt to duplicate the conditions that the vehicle was operating at when the code was set. If the conditions can be duplicated, the Good Trip counter will change to one or more. 2. If the conditions cannot be duplicated, erase trouble codes, disconnect the DRB and continue. 3. If the repaired OBD II trouble code has reset, or the OBD II monitor failed after running, the repair is not complete. Check for any technical service bulletins or flash updates and return to Symptom List. 4. If a new DTC has set, return to Symptom List and perform the tests specified for that code. 5. If the monitor ran, and the Good Trip counter changed to one or more, the repair was successful. 6. Erase trouble codes. 7. Disconnect the DRB. <p>Repair is complete.</p>	All

Verification Tests — Continued

VERIFICATION TEST VER-5A3	APPLICABILITY
<ol style="list-style-type: none"> 1. With the DRB III, monitor the pre-test enabling conditions until all conditions have been met to run the appropriate monitor. Run the appropriate monitor for the repaired DTC. 2. If the repaired OBD II trouble code has reset, or the OBD II monitor failed after running, the repair is not complete. Check for any technical service bulletins or flash updates and return to Symptom List. 3. If a new DTC has set, return to Symptom List and perform the tests specified for that code. 4. If the monitor ran, and the Good Trip counter changed to one or more, the repair was successful. 5. Erase trouble codes. 6. Disconnect the DRB. <p>Repair is complete.</p>	All

VERIFICATION TEST VER-6A	APPLICABILITY
<ol style="list-style-type: none"> 1. Inspect the vehicle to ensure that all engine components are connected. Reassemble and reconnect components as necessary. 2. The LDP Dealer Test Mode has been added to the DRB III to verify repairs to the LDP System. A DRB software program was written which causes the PCM to run the LDP Monitor as part of this test. Test failures will be indicated through a stored DTC. 3. Dealer Test Mode is a useful way to run a total system performance test. Use this test to verify any type of LDP system repair. 4. The software program makes temporary changes to the operating mode of the PCM. For this reason, it is CRITICAL that the test not be interrupted. 5. PCMs left in this mode as the result of an interrupted test will illuminate the MIL for 8-10 minutes of driving with no DTCs stored. Erasing DTCs will not change this condition. 6. If a vehicle is found to be stuck in the mode described above, the LDP Dealer Test should be rerun in its entirety so that the software program in the DRB III can restore the PCM operating mode. 7. Note the similarity to the LDP Monitor screen found under OBD II Monitors. Failure modes are fewer in this system test than in the OBD II LDP Monitor. The system test will only store the Small Leak DTC to indicate a problem with the system. 8. No other type of failure mode indication is given. The system test failure may have been, for example, due to a large leak, but the PCM will set the Small Leak DTC to indicate failures that occurred as part of the system test. 9. Connect DRB to the Data Link Connector. 10. Turn off all accessories. 11. With the DRB III in LDP Dealer Test Mode, follow the instructions on the screen. <p>Repair is complete.</p>	All

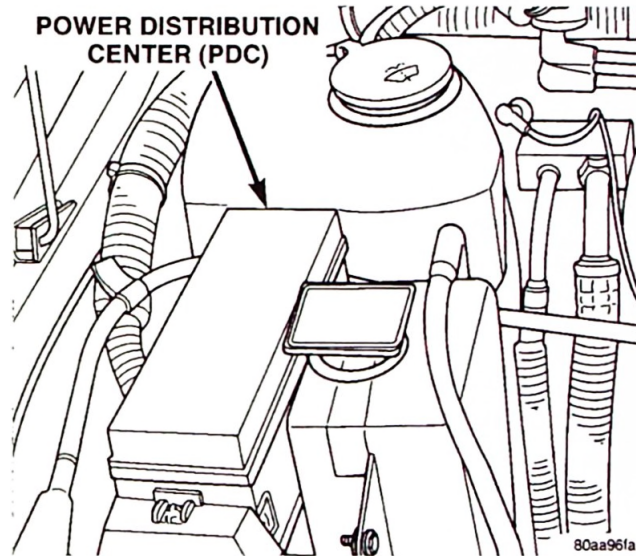
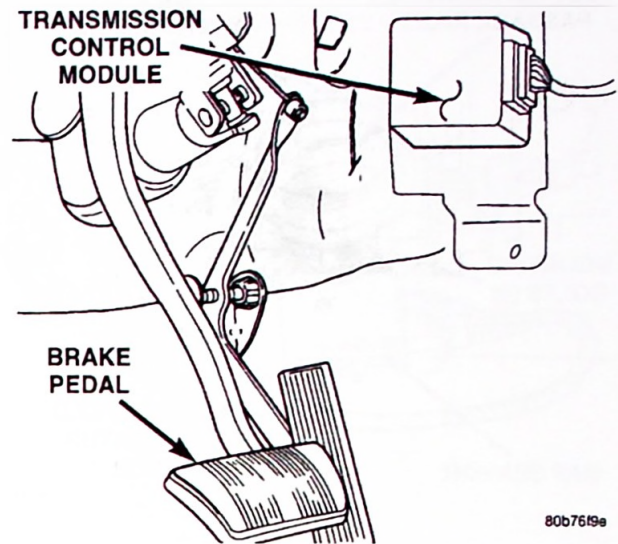
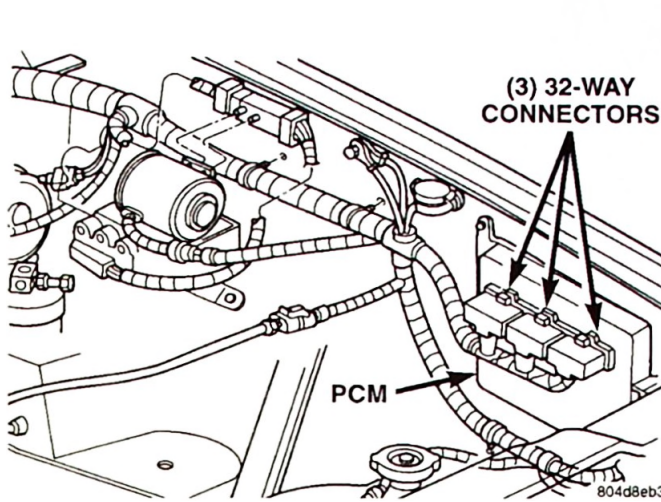
VERIFICATION TESTS

Verification Tests — Continued

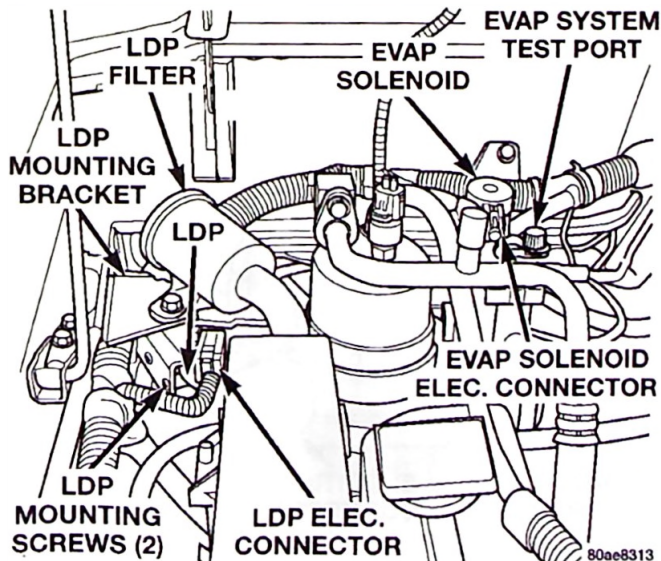
VERIFICATION TEST VER-6A	APPLICABILITY
<ol style="list-style-type: none"> 1. If PCM has been changed and correct VIN and mileage have not been programmed, a DTC will be set in ABS and Air bag modules. In addition, if vehicle is equipped with a Sentry Key Immobilizer Module (SKIM), Secret Key data must be updated to enable start. 2. For ABS and Air Bag Systems: Enter correct VIN and Mileage in PCM. Erase codes in ABS and Air Bag modules. 3. For SKIM theft alarm: Connect DRB to data link conn. Go to Theft Alarm, SKIM, Misc, and place SKIM in secured access mode, by using appropriate PIN code for this vehicle. Select Update the Secret Key data, data will be transferred from SKIM to PCM. 4. Inspect the vehicle to ensure that all engine components are connected. Reassemble and reconnect components as necessary. 5. If any existing diagnostic trouble codes not repaired, go to symptom list and follow path specified. After all diagnostic trouble codes have been repaired, return to TEST VER-6A and run LDP Dealer Test Mode under Systems Test in DRBIII. 6. The LDP Dealer Test Mode has been added to the DRBIII to verify repairs to the LDP System. A DRB software program was written which causes the PCM to run the LDP Monitor as part of this test. Test failures will be indicated through a stored DTC. 7. Dealer Test Mode is a useful way to run a total system performance test. Use this test to verify any type of LDP system repair. 8. Software program makes temporary changes to operating mode of PCM. For this reason, it is critical that test not be interrupted. PCM's left in this mode as result of interrupted test will illuminate the MIL for 8-10 mile of driving with no DTC's stored. 9. Erasing DTC's will not change this condition. 10. If a vehicle is found to be stuck in the mode described above, the LDP Dealer Test should be re-run in its entirety so that the software program in the DRBIII can restore the PCM operating mode. 11. Note similarity to LDP Monitor screen found under OBDII Monitors. Failure modes are fewer in this System Test than OBDII LDP Monitor. System Test only store Small Leak DTC to indicate problem with system. No other type of failure mode indication given. 12. System Test failure may have been, for example, due to a large leak, but the PCM will set the Small Leak DTC to indicate failures that occurred as part of the system test. 13. Connect the DRB to the data link connector. Engine running, turn off all accessories. 14. Note: While test is being performed, PCM must see RPM, minimum MAP, No Vehicle speed and minimum Throttle Position sensor (At idle, in park.) With DRBIII in LDP Dealer Test Mode follow the instructions on the screen. 15. If the Small Leak DTC trouble code has set, the repair is not complete. Check for any related Technical Service Bulletins and return to Symptom List. 16. If any other trouble code has set, return to Symptom List and follow the path specified for that trouble code. If there are no trouble codes, the repair was successful and is now complete. 	All

8.0 COMPONENT LOCATIONS

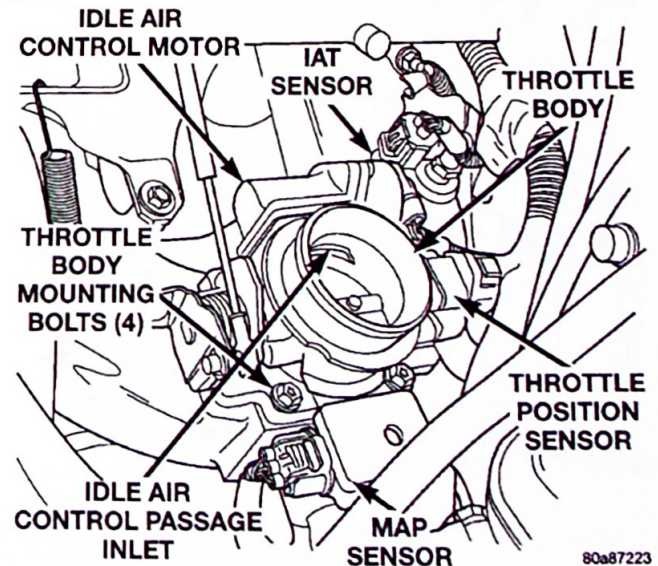
8.1 CONTROL MODULES AND PDC



8.2 CONTROLS AND SOLENOIDS



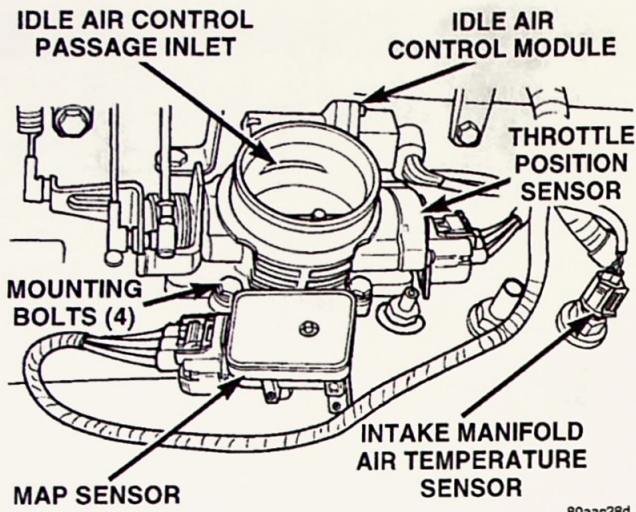
2.5L



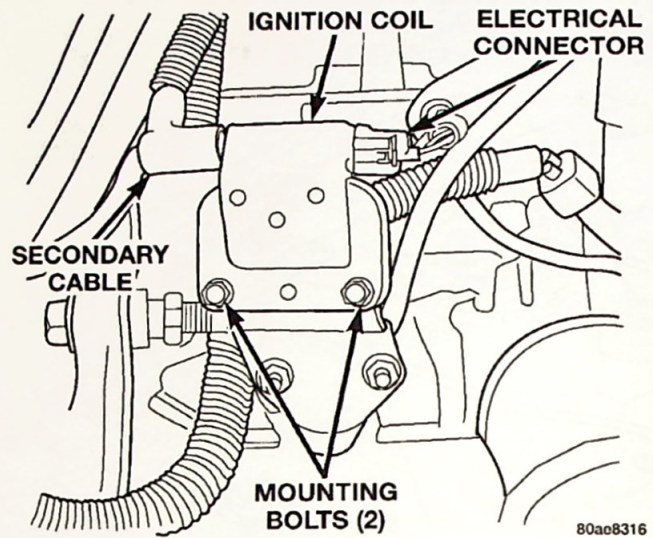
COMPONENT LOCATIONS

8.2 CONTROLS AND SOLENOIDS (Continued)

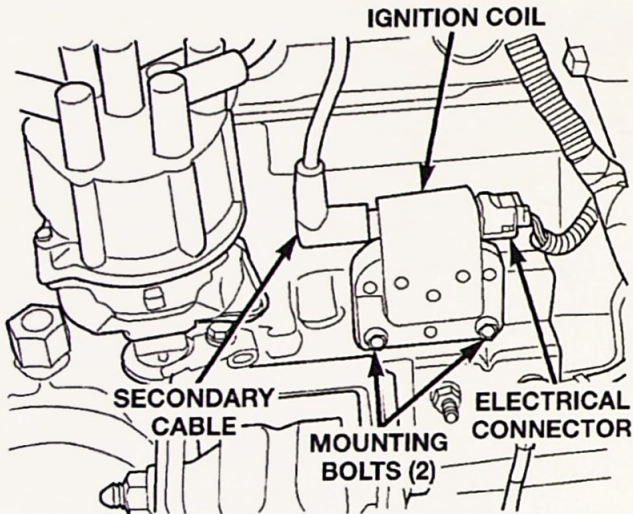
4.0L



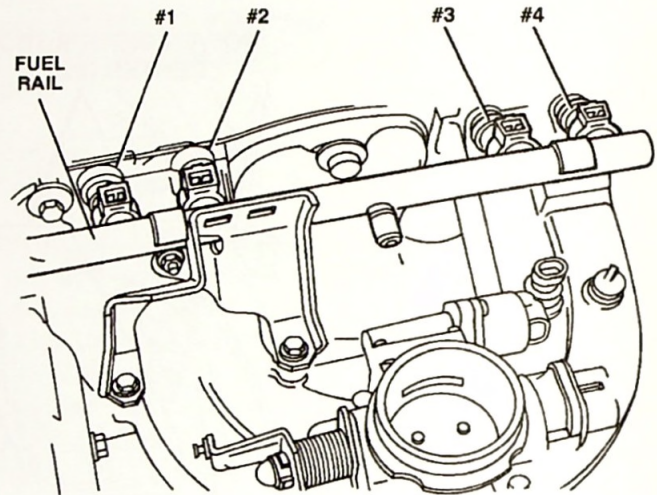
2.5L



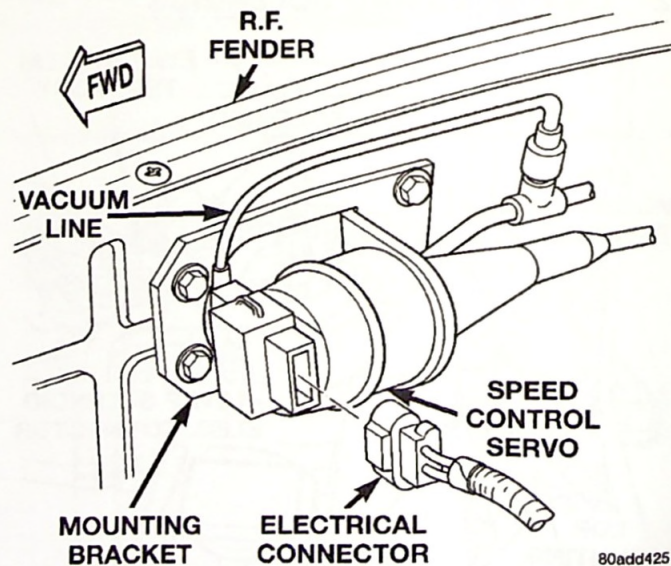
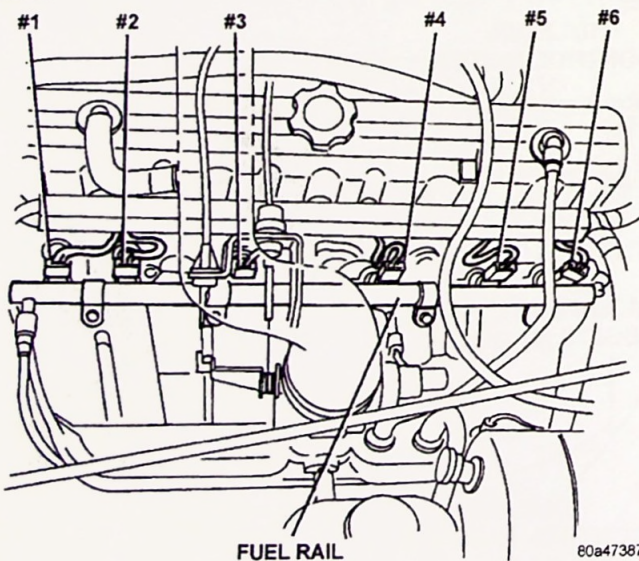
4.0L

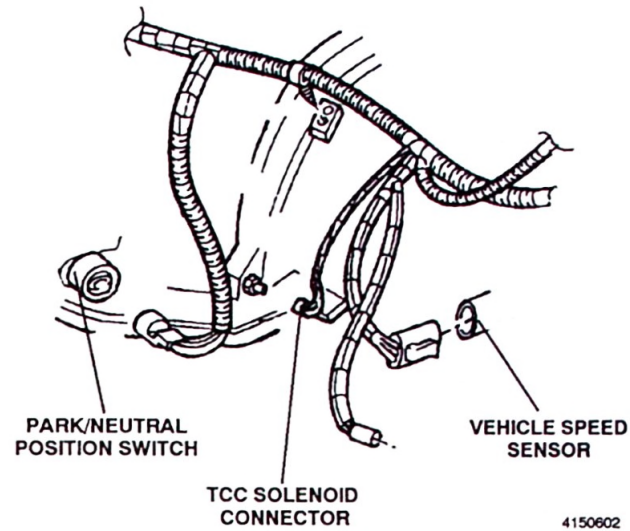


2.5L

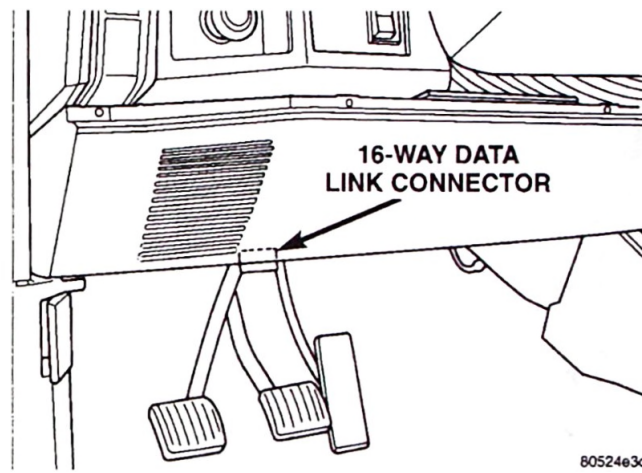


4.0L

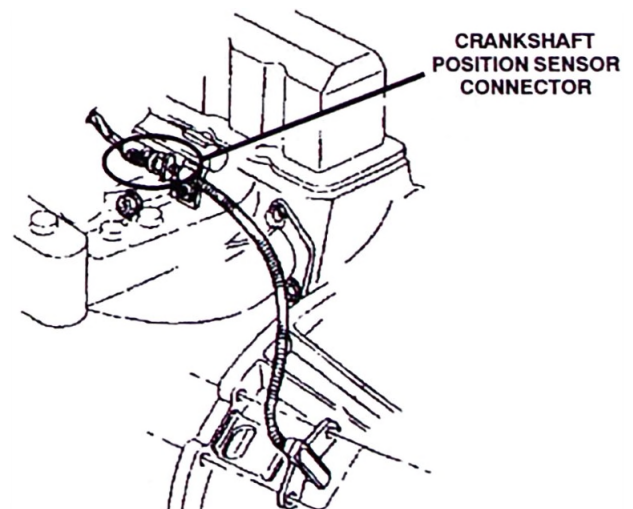
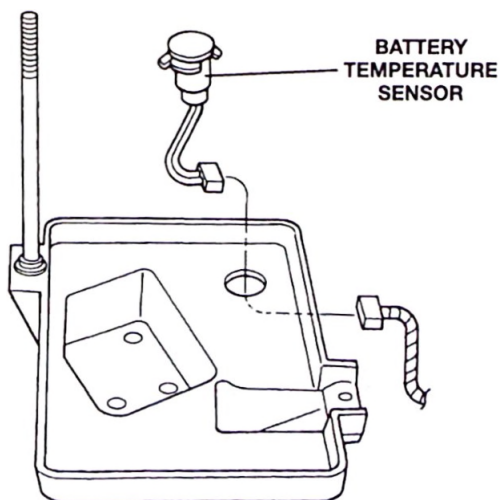




8.3 DATA LINK CONNECTOR

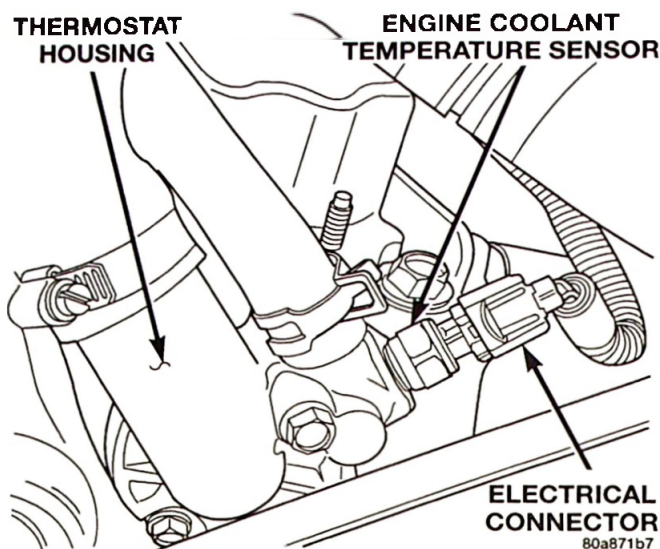
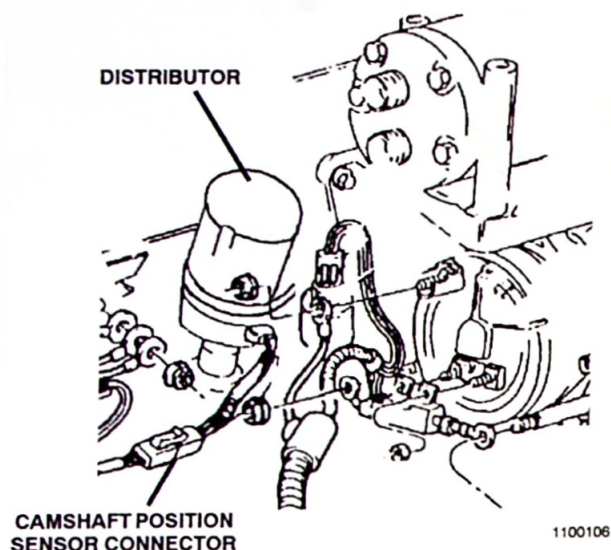


8.4 SENSORS

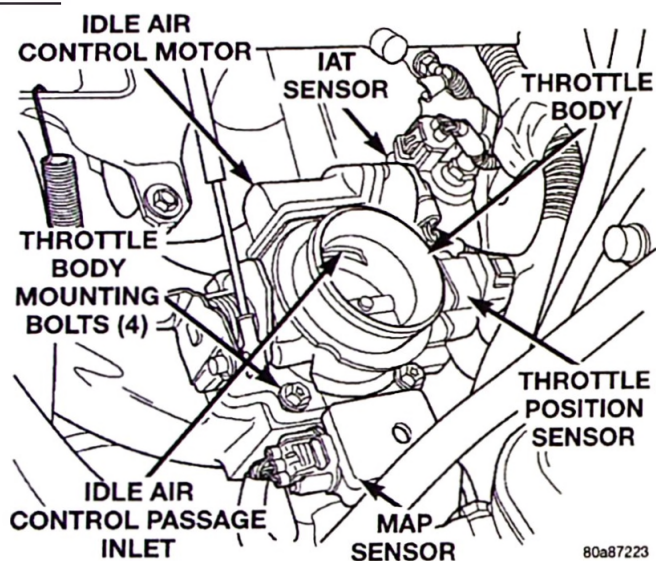


COMPONENT LOCATIONS

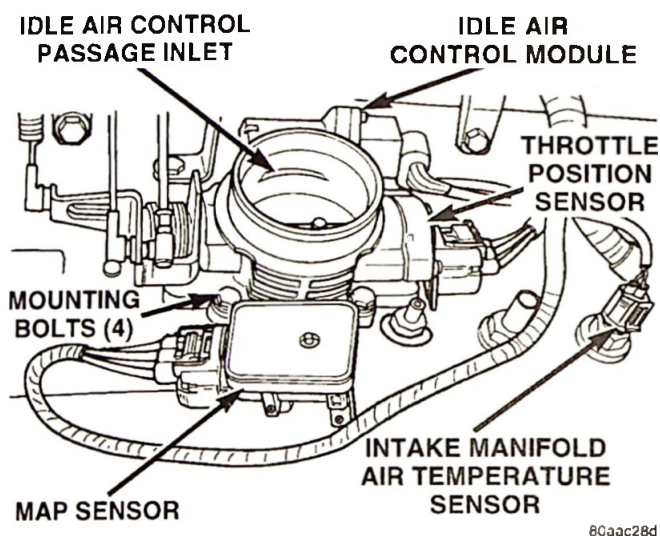
8.4 SENSORS (Continued)



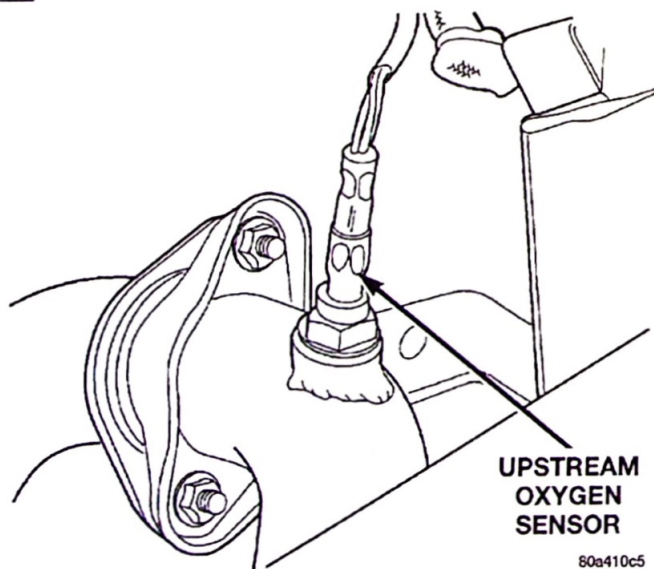
2.5L



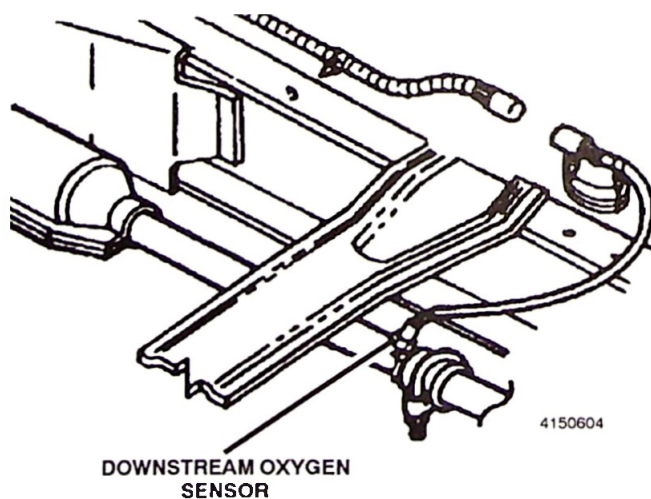
4.0L

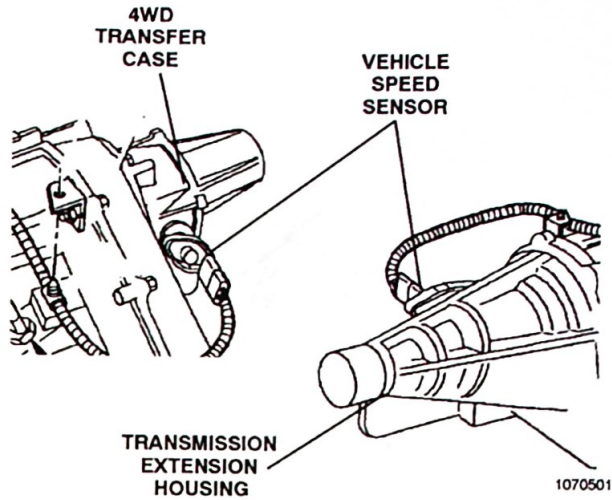


1/1

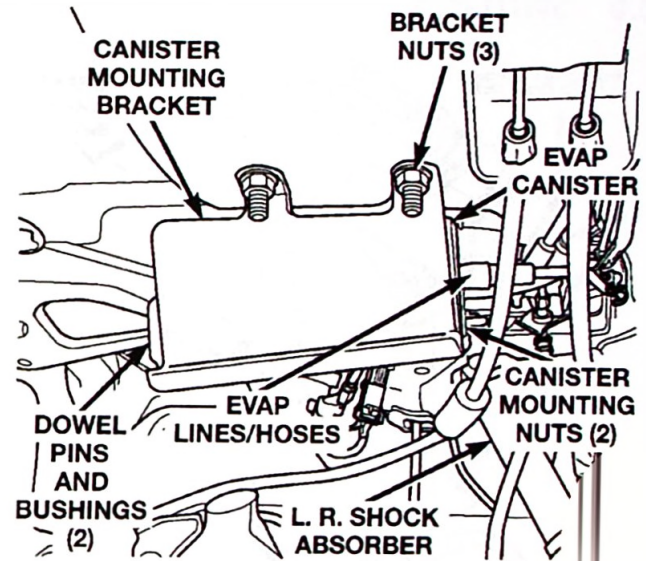
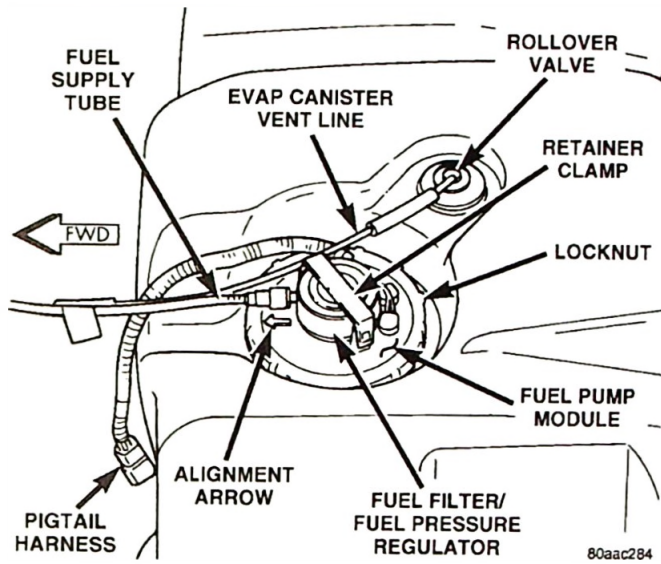


1/2

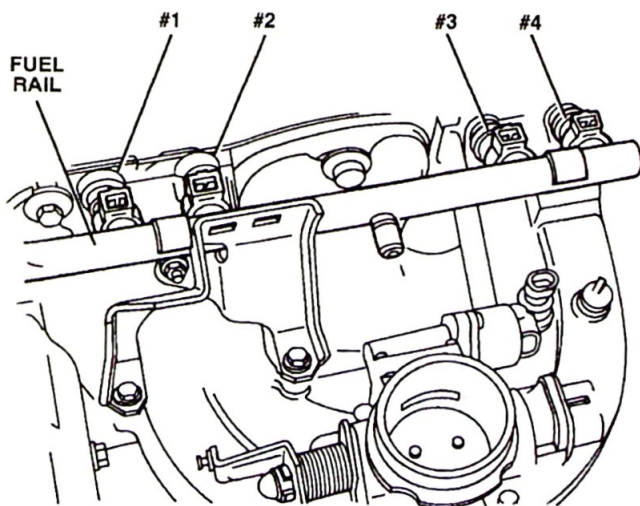




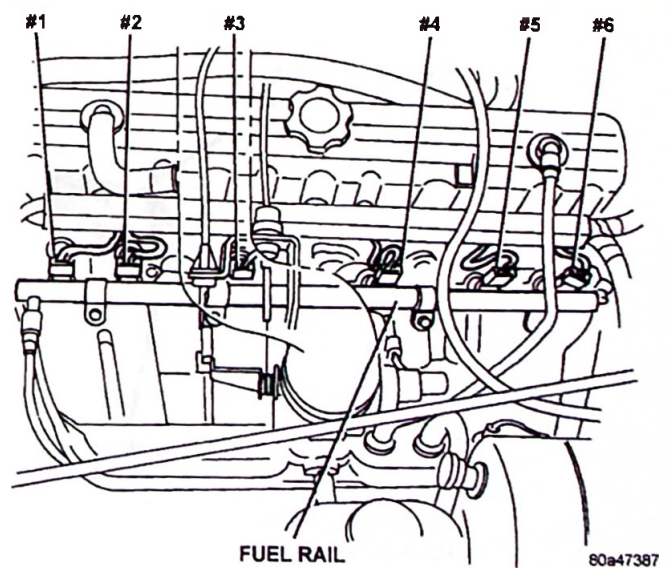
8.5 FUEL SYSTEM



2.5L

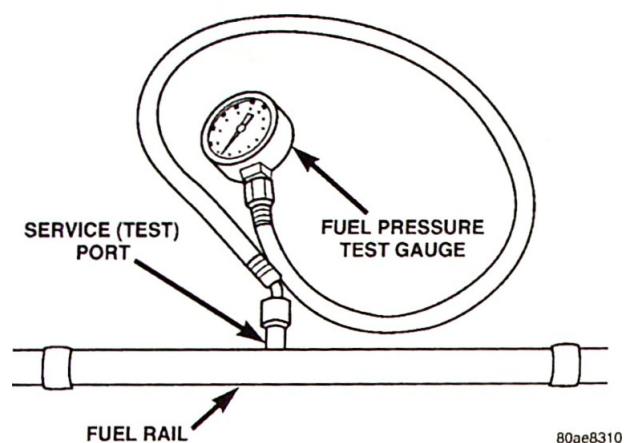


4.0L



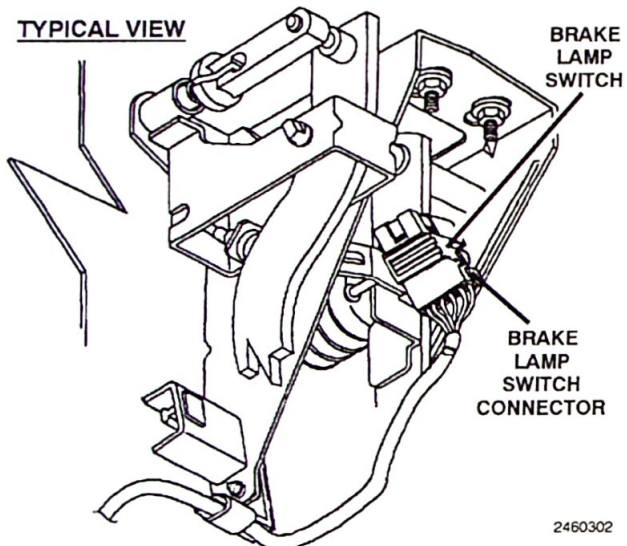
COMPONENT LOCATIONS

8.5 FUEL SYSTEM (Continued)

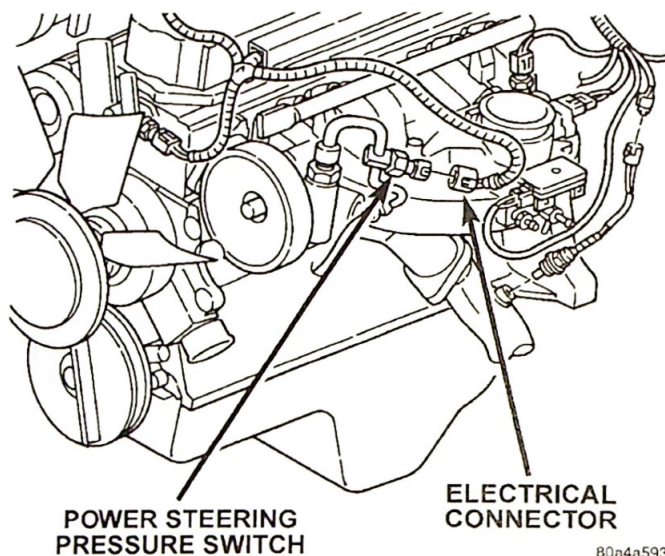


80ae8310

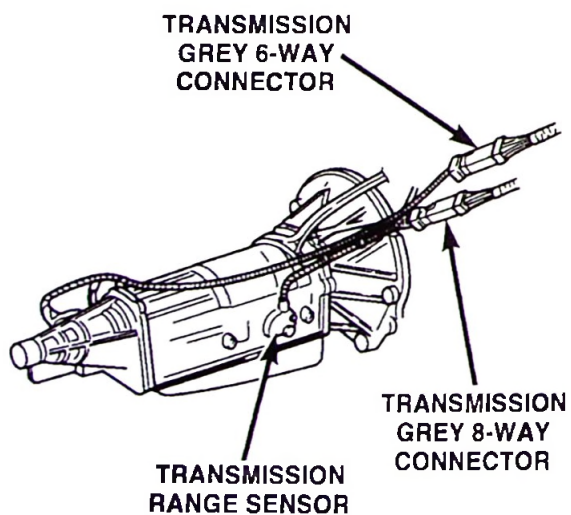
8.6 SWITCHES



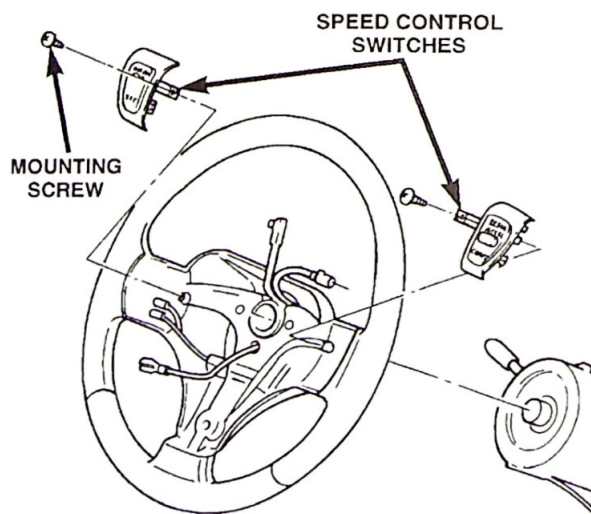
2460302



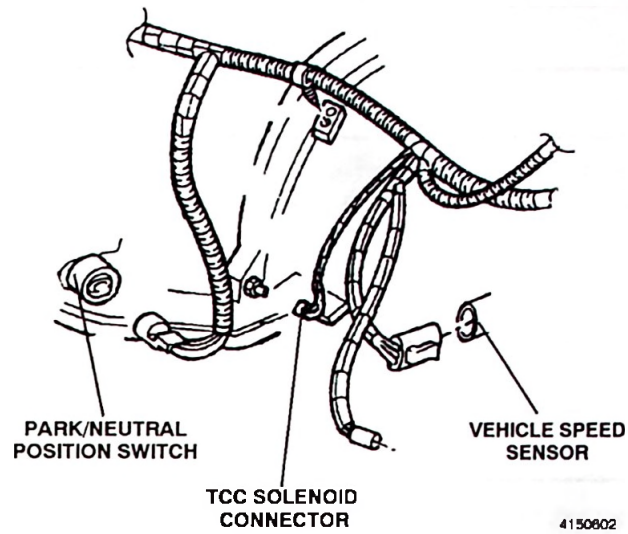
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80ab24a3

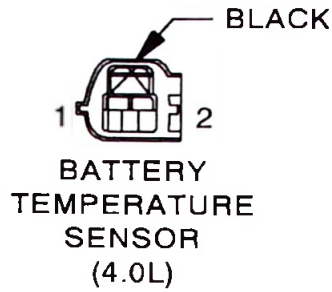


80a0754e



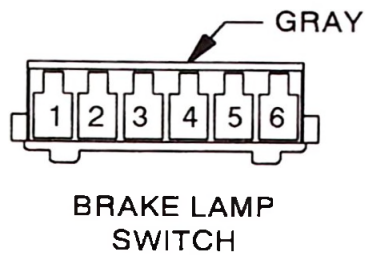
NOTES

9.0 CONNECTOR PINOUTS



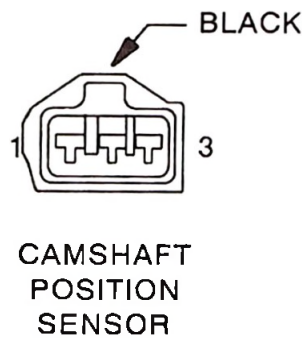
BATTERY TEMPERATURE SENSOR (4.0L) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K118 18PK/YL	BATTERY TEMPERATURE SENSOR SIGNAL
2	K167 20BR/YL	SENSOR RETURN



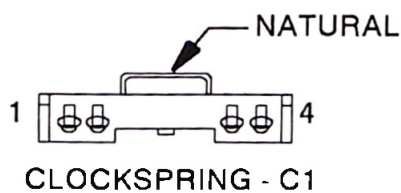
BRAKE LAMP SWITCH - GRAY 6 WAY

CAV	CIRCUIT	FUNCTION
1	K29 18WT/PK	BRAKE LAMP SWITCH SENSE
2	Z1 18BK	GROUND
3	V32 20YL/RD	SPEED CONTROL ON/OFF SENSE
4	V30 20DB/RD	SPEED CONTROL BRAKE SWITCH OUTPUT
5	L50 20WT/TN	BRAKE LAMP SWITCH OUTPUT
6	F32 20PK/DB	FUSED B(+)



CAMSHAFT POSITION SENSOR - BLACK 3 WAY

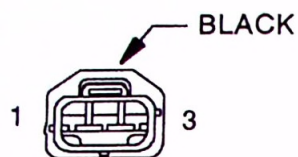
CAV	CIRCUIT	FUNCTION
1	K44 18TN/YL	CAMSHAFT POSITION SENSOR SIGNAL
2	K167 18BR/YL	SENSOR GROUND
3	K7 18OR	5 VOLT SUPPLY



CLOCKSPRING C1 - NATURAL 4 WAY

CAV	CIRCUIT	FUNCTION
1	X3 20BK/RD	HORN RELAY CONTROL
2	V37 20RD/LG	SPEED CONTROL SWITCH SIGNAL
3	K4 20BK/LB (RHD)	SENSOR GROUND
3	K4 20BK/RD (LHD)	SENSOR GROUND
4	-	-

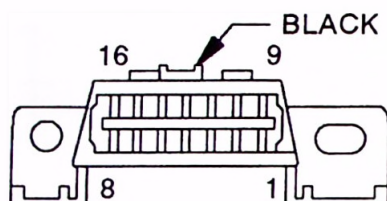
CONNECTOR PINOUTS



CRANKSHAFT
POSITION SENSOR

CRANKSHAFT POSITION SENSOR - BLACK 3 WAY

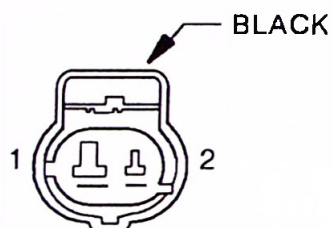
CAV	CIRCUIT	FUNCTION
1	K24 18GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL
2	K167 20BR/YL	SENSOR GROUND
3	K7 20OR	5 VOLT SUPPLY



DATA LINK
CONNECTOR

DATA LINK CONNECTOR - BLACK 16 WAY

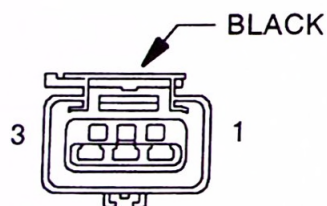
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	D1 18VT/BR	CCD BUS (+)
4	Z1 18BK	GROUND
5	Z12 18BK/TN	GROUND
6	D20 20LG/BK	SCI RECEIVE
7	D21 20PK	SCI TRANSMIT
8	-	-
9	-	-
10	-	-
11	D2 18WT/BK	CCD BUS (-)
12	-	-
13	-	-
14	-	-
15	-	-
16	F34 18TN/BK	FUSED B(+)



ENGINE COOLANT
TEMPERATURE
SENSOR

ENGINE COOLANT TEMPERATURE SENSOR - BLACK 2 WAY

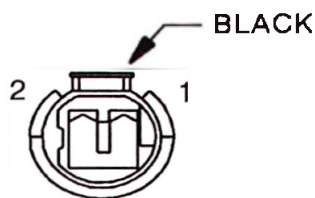
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR SIGNAL RETURN
2	K2 18TN/BK	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL



ENGINE OIL
PRESSURE SENSOR

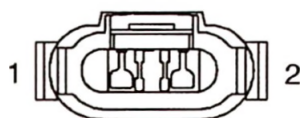
ENGINE OIL PRESSURE SENSOR - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	K7 18OR	5 VOLT SUPPLY
2	G60 18GY/YL	ENGINE OIL PRESSURE SENSOR SIGNAL
3	K167 18BR/YL	SENSOR RETURN



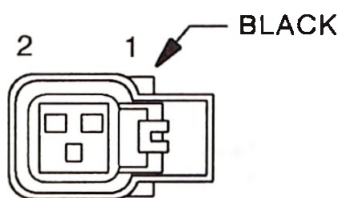
DUTY CYCLE
EVAP/PURGE
SOLENOID

DUTY CYCLE EVAP/PURGE SOLENOID - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	K52 18PK/BK	DUTY CYCLE EVAP PURGE SOLENOID CONTROL
2	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)



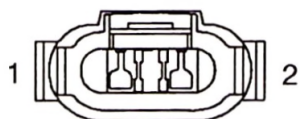
FUEL INJECTOR NO. 1
(2.5L)

FUEL INJECTOR NO. 1 (2.5L) - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K11 18WT/DB	FUEL INJECTOR NO. 1 DRIVER



FUEL INJECTOR NO. 1
(4.0)

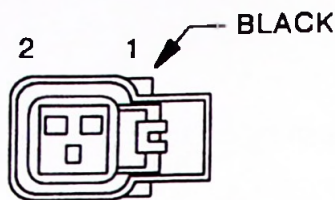
FUEL INJECTOR NO. 1 (4.0L) - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K11 18WT/DB	FUEL INJECTOR NO. 1 DRIVER



FUEL INJECTOR NO. 2
(2.5L)

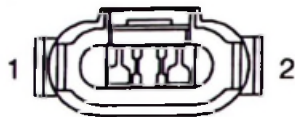
FUEL INJECTOR NO. 2 (2.5L) - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K12 18TN	FUEL INJECTOR NO. 2 DRIVER

CONNECTOR PINOUTS



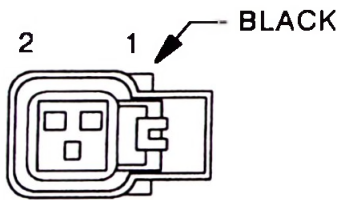
FUEL INJECTOR NO. 2
(4.0L)

FUEL INJECTOR NO. 2 (4.0L) - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K12 18TN	FUEL INJECTOR NO. 2 DRIVER



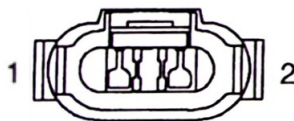
FUEL INJECTOR NO. 3
(2.5L)

FUEL INJECTOR NO. 3 (2.5L) - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K13 18YL/WT	FUEL INJECTOR NO. 3 DRIVER



FUEL INJECTOR NO. 3
(4.0L)

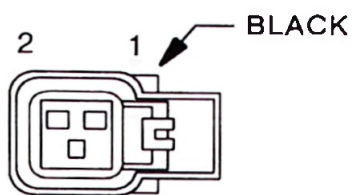
FUEL INJECTOR NO. 3 (4.0L) - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K13 18YL/WT	FUEL INJECTOR NO. 3 DRIVER



FUEL INJECTOR NO. 4
(2.5L)

FUEL INJECTOR NO. 4 (2.5L) - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K14 18LB/BR	FUEL INJECTOR NO. 4 DRIVER

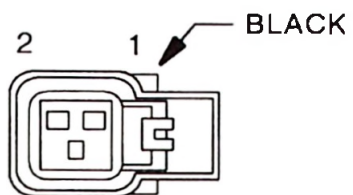
CONNECTOR PINOUTS



FUEL INJECTOR NO. 4
(4.0L)

FUEL INJECTOR NO. 4 (4.0L) - BLACK 2 WAY

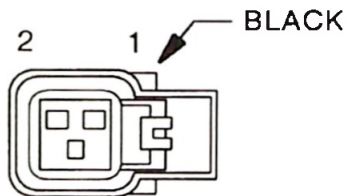
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K14 18LB/BR	FUEL INJECTOR NO. 4 DRIVER



FUEL INJECTOR NO. 5
(4.0L)

FUEL INJECTOR NO. 5 (4.0L) - BLACK 2 WAY

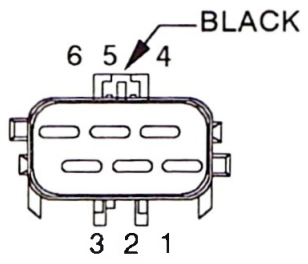
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K15 18PK/BK	FUEL INJECTOR NO. 5 DRIVER



FUEL INJECTOR NO. 6
(4.0L)

FUEL INJECTOR NO. 6 (4.0L) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K16 18LG/BK	FUEL INJECTOR NO. 6 DRIVER



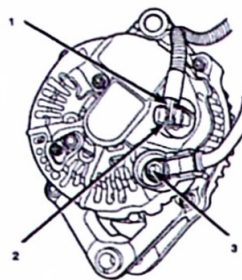
FUEL PUMP
MODULE

FUEL PUMP MODULE - BLACK 6 WAY

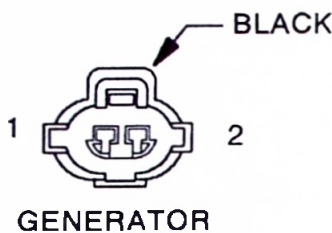
CAV	CIRCUIT	FUNCTION
1	A141 16DG/WT	FUEL PUMP RELAY OUTPUT
2	-	-
3	K226 20DB/LG	FUEL LEVEL SENSOR SIGNAL
4	K167 20BR/YL	SENSOR RETURN
5	-	-
6	Z1 16BK	GROUND

CONNECTOR PINOUTS

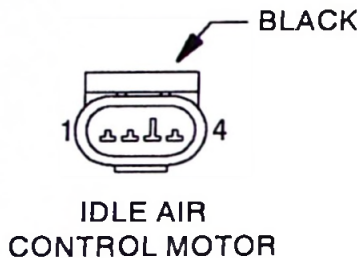
CONNECTOR PINOUTS



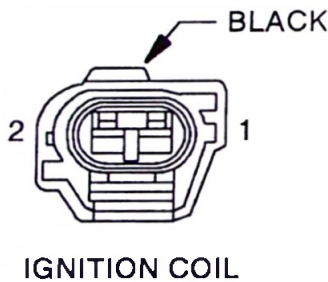
GENERATOR		
CAV	CIRCUIT	FUNCTION
1	-	FIELD WIRES
2	-	FIELD WIRE CONNECTOR
3	-	B(+) (OUTPUT TERMINAL)



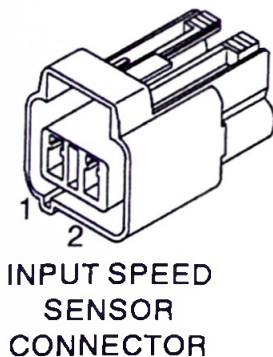
GENERATOR - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	K72 16DG/OR	GENERATOR DRIVER
2	K20 18DG	GENERATOR FIELD DRIVER (-)



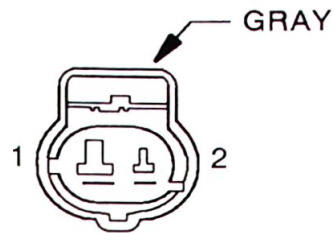
IDLE AIR CONTROL MOTOR - BLACK 4 WAY		
CAV	CIRCUIT	FUNCTION
1	K59 18VT/BK	IDLE AIR CONTROL NO. 4 DRIVER
2	K40 18BR/WT	IDLE AIR CONTROL NO. 3 DRIVER
3	K60 18YL/BK	IDLE AIR CONTROL NO. 2 DRIVER
4	K39 18GY/RD	IDLE AIR CONTROL NO. 1 DRIVER



IGNITION COIL - BLACK 2 WAY		
CAV	CIRCUIT	FUNCTION
1	A142 18DG/OR	AUTOMATIC SHUT DOWN RELAY OUTPUT
1	K19 18GY (2WD)	IGNITION COIL NO. 1 DRIVER
2	A142 18DG/OR (2WD)	AUTOMATIC SHUT DOWN RELAY OUTPUT
2	K19 18GY	IGNITION COIL NO. 1 DRIVER



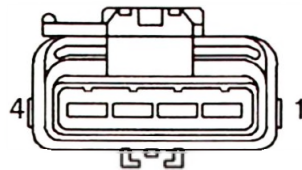
INPUT SPEED SENSOR - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	VT/BK	INPUT SPEED SENSOR GROUND
2	BK/RD	INPUT SPEED SENSOR SIGNAL



INTAKE AIR
TEMPERATURE
SENSOR

INTAKE AIR TEMPERATURE SENSOR - GRAY 2 WAY

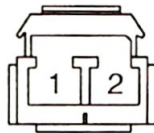
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR RETURN
2	K21 18BK/RD	INTAKE AIR TEMPERATURE SENSOR SIGNAL



EVAP LEAK
DETECTION
PUMP

EVAP LEAK DETECTION PUMP - 4 WAY

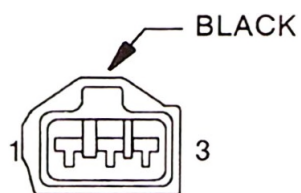
CAV	CIRCUIT	FUNCTION
1	-	-
2	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
3	K106 18WT/DG	LEAK DETECTION PUMP SOLENOID CONTROL
4	K105 18OR	LEAK DETECTION PUMP SWITCH SENSE



LEFT SPEED
CONTROL SWITCH

LEFT SPEED CONTROL SWITCH - 2 WAY

CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR RETURN
2	V37 20RD/LG	SPEED CONTROL SWITCH SIGNAL

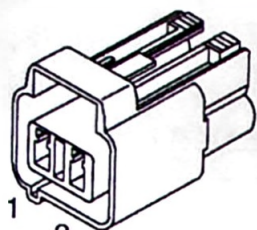


MANIFOLD
ABSOLUTE PRESSURE
SENSOR

MANIFOLD ABSOLUTE PRESSURE SENSOR - BLACK 3 WAY

CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR RETURN
2	K1 18DG/RD	MAP SENSOR SIGNAL
3	K7 20OR	5V SUPPLY

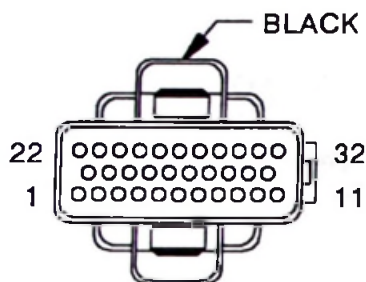
CONNECTOR PINOUTS



OUTPUT SPEED
SENSOR
CONNECTOR

OUTPUT SPEED SENSOR - 2 WAY

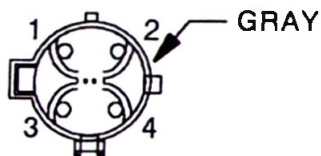
CAV	CIRCUIT	FUNCTION
1	VT/BK	OUTPUT SPEED SENSOR GROUND
2	BK/RD	OUTPUT SPEED SENSOR SIGNAL



POWERTRAIN
CONTROL
MODULE - C1

OXYGEN SENSOR (SENSOR SIDE)

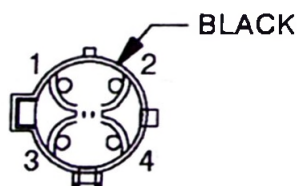
CAV	CIRCUIT	FUNCTION
1	-	GROUND
2	-	AUTOMATIC SHUT DOWN RELAY OUTPUT
3	-	OXYGEN SENSOR GROUND
4	-	OXYGEN SENSOR SIGNAL



OXYGEN
SENSOR 1/1
UPSTREAM

OXYGEN SENSOR 1/1 UPSTREAM - GRAY 4 WAY

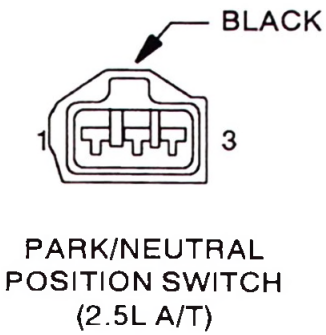
CAV	CIRCUIT	FUNCTION
1	F142 20DG/WT	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
2	Z1 18BK	GROUND
3	K167 20BR/YL	SENSOR RETURN
4	K41 18BK/DG	UPSTREAM HEATED OXYGEN SENSOR SIGNAL



OXYGEN
SENSOR 1/2
DOWNSTREAM

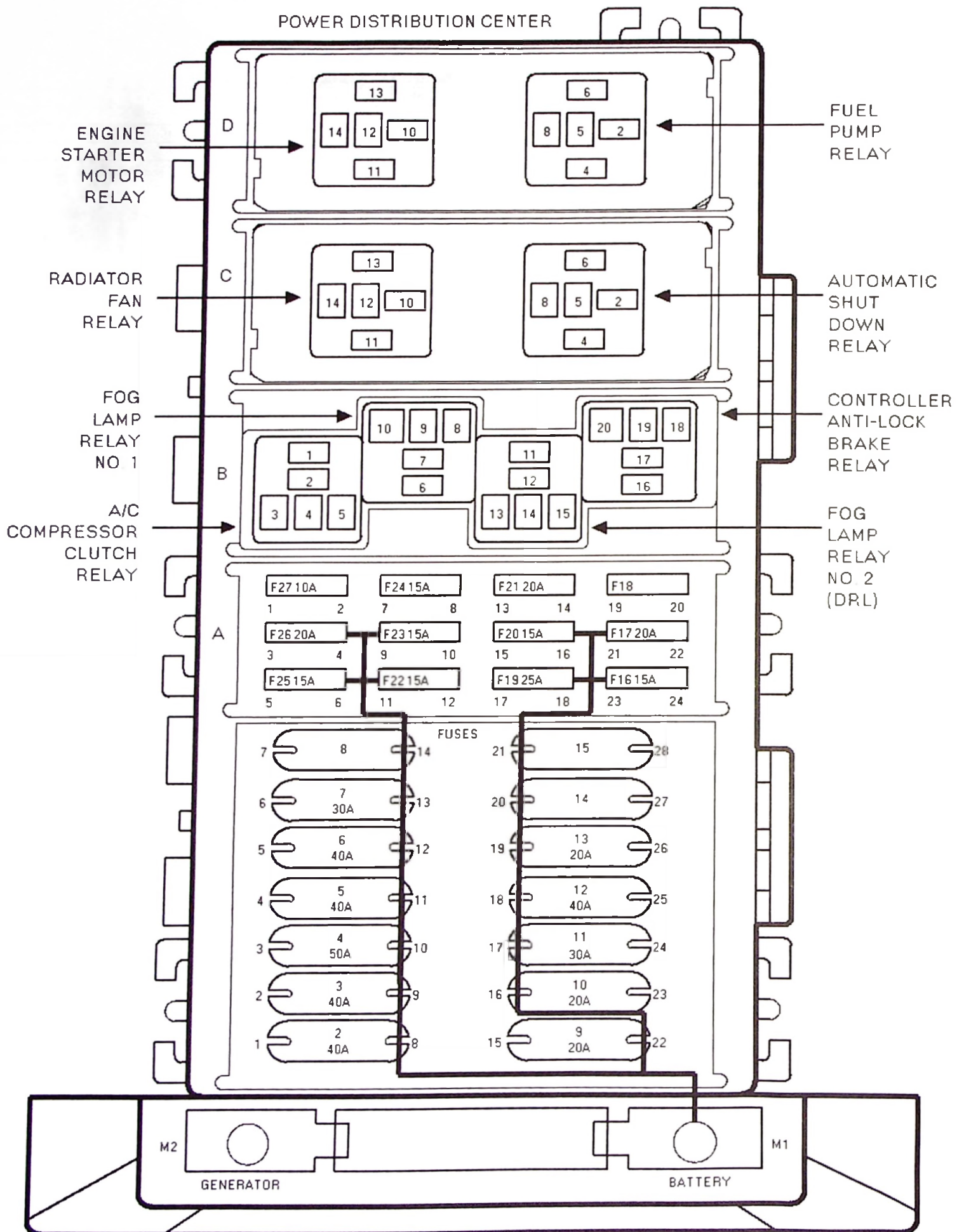
OXYGEN SENSOR 1/2 DOWNSTREAM - BLACK 4 WAY

CAV	CIRCUIT	FUNCTION
1	F142 20DB/WT	FUSED AUTOMATIC SHUT DOWN RELAY OUTPUT
2	Z1 20BK	GROUND
3	K167 18BR/YL	SENSOR RETURN
4	K141 18TN/WT	OXYGEN SENSOR 1/2 SIGNAL



PARK/ NEUTRAL POSITION SWITCH (2.5L A/T) - BLACK 3 WAY		
CAV	CIRCUIT	FUNCTION
1	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
2	T41 18BK/WT	PARK NEUTRAL POSITION SWITCH
3	L10 18BR/LG	TRS REVERSE SENSE

CONNECTOR PINOUTS



FUSES			
FUSE NO.	AMPS	FUSED CIRCUIT	FEED CIRCUIT
1	40A	-	-
2	40A	A1 12RD	A0 6RD
3	40A	A2 12PK/BK	A0 6RD
4	50A	A7 10RD/BK	A0 6RD
5	40A	F141 12LG/RD	A0 6RD
6	40A	A111 12RD/LG	A0 6RD
7	30A	A3 14RD/WT	A0 6RD
7	30A	A3 14RD/WT (DRL)	A0 6RD
8	-	-	-
9	20A	A17 16RD/BK	A0 6RD
9	20A	A17 16RD/BK	A0 6RD
10	20A	A41 16YL	A0 6RD
11	30A	A4 12BKPK	A0 6RD
12 (ABS)	40A	A10 12RD/DG	A0 6RD
13 (ABS)	20A	A20 12RD/DB	A0 6RD
14	-	-	-
15	-	-	-
16	15A	M1 20PK	A0 6RD
17	20A	F34 18TN/BK	A0 6RD
18	-	-	-
19	25A	A16 16RD/LG	A0 6RD
20	15A	L9 20BK/PK	A0 6RD
21	20A	A142 18DG/OR	A999 16RD
22	15A	A61 14DG/BK	A0 6RD
23	15A	F32 20PK/DB	A0 6RD
24	15A	F142 20DG/WT	A999 16RD
25	15A	F51 20WT/OR	A0 6RD
26	20A	F75 16VT	A0 6RD
27	10A	F1 20DB/GY	A17 16RD/BK

A/C COMPRESSOR CLUTCH RELAY

CAV	CIRCUIT	FUNCTION
B1	A17 16RD/BK	FUSED B(+)
B2	C3 16DB/BK	A/C COMPRESSOR CLUTCH RELAY OUTPUT
B3	C13 18DB/OR	A/C COMPRESSOR CLUTCH RELAY CONTROL
B4	-	-
B5	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)

AUTOMATIC SHUT DOWN RELAY

CAV	CIRCUIT	FUNCTION
C2	A16 16RD/LG	FUSED B(+)
C4	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
C5	-	-
C6	K51 18DB/YL	AUTOMATIC SHUT DOWN RELAY CONTROL
C8	A999 16RD	AUTOMATIC SHUT DOWN RELAY OUTPUT
C8	A999 16RD	AUTOMATIC SHUT DOWN RELAY OUTPUT

CONTROLLER ANTI-LOCK BRAKE RELAY

CAV	CIRCUIT	FUNCTION
B16	G19 20LG/OR	ABS WARNING INDICATOR DRIVER
B17	-	-
B18	G83 18GY/BK	ABS RELAY CONTROL
B19	Z1 20BK	GROUND
B20	F15 20DB/WT	FUSED IGNITION SWITCH OUTPUT (RUN)

CONNECTOR PINOUTS

ENGINE STARTER MOTOR RELAY

CAV	CIRCUIT	FUNCTION
D10	A41 16YL	FUSED B(+)
D11	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
D11	T41 20BK/WT	PARK/NEUTRAL POSITION SWITCH SENSE
D11	Z1 20BK (4.0L M/T)	GROUND
D12	-	-
D13	F45 20YL/RD (LHD 4.0L A/T)	FUSED B(+) ENGINE STARTER MOTOR RELAY
D13	T141 20YL (2.5L, 4.0L M/T, RHD 4.0L A/T)	IGNITION SWITCH OUTPUT (START)
D14	T40 16BR	STARTER RELAY OUTPUT

FOG LAMP RELAY NO. 1

CAV	CIRCUIT	FUNCTION
B6	F61 20WT/OR	FUSED B(+)
B7	L139 20VT	FOG LAMP RELAY OUTPUT
B7	L92 20PK (DRL)	FOG LAMP RELAY OUTPUT
B8	L35 20BR/WT	FOG LAMP RELAY CONTROL
B8	Z1 20BK (DRL)	GROUND
B8	Z1 20BK (DRL)	GROUND
B9	-	-
B10	L77 20BR/YL	FUSED LEFT INBOARD TAIL LAMP
B10	L77 20BR/YL	FUSED LEFT INBOARD TAIL LAMP

FOG LAMP RELAY NO. 2 (DRL)

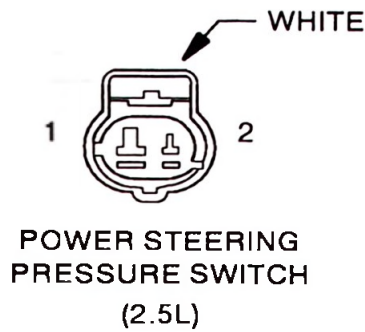
CAV	CIRCUIT	FUNCTION
B11	L92 20PK	FOG LAMP RELAY OUTPUT
B12	-	-
B13	Z1 20BK	GROUND
B14	L139 20VT	FOG LAMP RELAY OUTPUT
B15	G34 16RD/GY	HIGH BEAM INDICATOR DRIVER
B15	G34 16RD/GY	HIGH BEAM INDICATOR DRIVER

FUEL PUMP RELAY

CAV	CIRCUIT	FUNCTION
D2	A61 14DG/BK	FUSED B(+)
D2	A61 16DG/BK	FUSED B(+)
D4	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
D6	K31 18BR	FUEL PUMP RELAY CONTROL
D8	A141 14DG/WT	FUEL PUMP RELAY OUTPUT

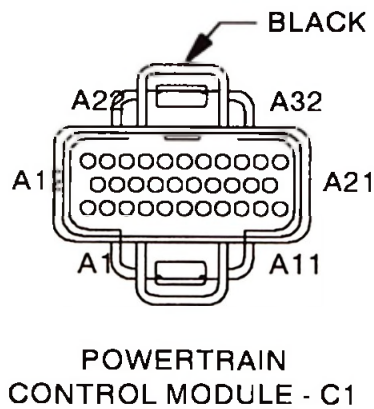
RADIATOR FAN RELAY

CAV	CIRCUIT	FUNCTION
C10	F141 12LG/RD	FUSED B(+)
C11	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
C12	-	-
C13	C27 18DB/PK	RADIATOR FAN RELAY CONTROL
C14	C25 12LB	RADIATOR FAN RELAY OUTPUT



POWER STEERING PRESSURE SWITCH (2.5L) - WHITE 2 WAY

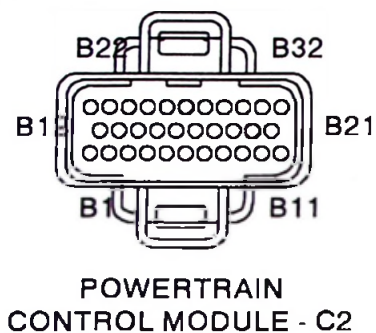
CAV	CIRCUIT	FUNCTION
1	Z1 20BK	GROUND
2	K10 180B/BR	POWER STEERING PRESSURE SWITCH (PSPS) SIGNAL



POWERTRAIN CONTROL MODULE C1 - BLACK 32 WAY

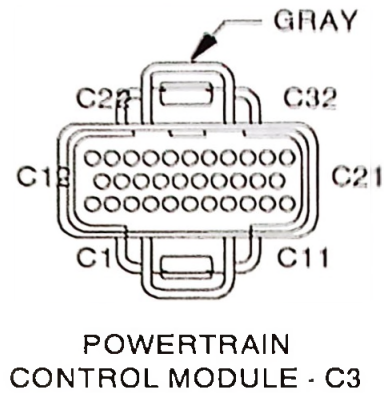
CAV	CIRCUIT	FUNCTION
A1	-	-
A2	F12 18DB/WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
A3	-	-
A4	K167 18BR/YL	SENSOR RETURN
A5	-	-
A6	T41 18BK/WT (2.5L A/T)	PARK/NEUTRAL POSITION SWITCH SENSE
A6	T41 18BK/WT (4.0L A/T)	TRANSMISSION RANGE SWITCH SENSE
A6	Z1 18BK	GROUND
A7	K19 18GY	IGNITION COIL NO. 1 DRIVER
A8	K24 18GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL
A9	-	-
A10	K60 18YL/BK	IDLE AIR CONTROL NO. 2 DRIVER
A11	K40 18BR/WT	IDLE AIR CONTROL NO. 3 DRIVER
A12	K10 18DB/BR (2.5L)	POWER STEERING PRESSURE SENSE
A12	K78 18GY (4.0L A/T)	IDLE ACTUATOR
A13	-	-
A14	-	-
A15	K21 18BK/RD	INTAKE AIR TEMPERATURE SENSOR SIGNAL
A16	K2 18TN/BK	ENGINE COOLANT TEMPERATURE SENSOR SIGNAL
A17	K7 18OR	5 VOLT SUPPLY
A18	K44 18TN/YL	CAMSHAFT POSITION SENSOR SIGNAL
A19	K39 18GY/RD	IDLE AIR CONTROL NO.1 DRIVER
A20	K59 18VT/BK	IDLE AIR CONTROL NO.1 DRIVER
A21	-	-
A22	A61 16DG/BK	FUSED B(+)
A23	K22 18OR/DG	THROTTLE POSITION SENSOR SIGNAL
A24	K41 18BK/DG	UPSTREAM HEATED OXYGEN SENSOR
A25	K141 18TN/WT	DOWNSTREAM HEATED OXYGEN SENSOR
A26	-	-
A27	K1 18DG/RD	MANIFOLD ABSOLUTE PRESSURE SENSOR SIGNAL
A28	-	-
A29	-	-
A30	-	-
A31	Z12 14BK/TN	GROUND
A32	Z12 14BK/TN	GROUND

CONNECTOR PINOUTS

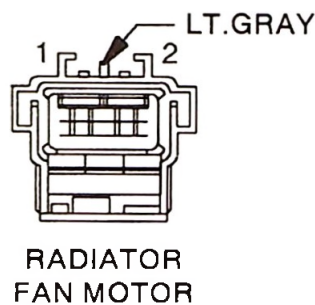


POWERTRAIN CONTROL MODULE C2 - 32 WAY

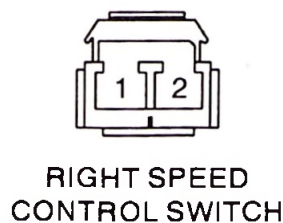
CAV	CIRCUIT	FUNCTION
B1	-	-
B2	-	-
B3	-	-
B4	K11 18WT/DB	FUEL INJECTOR NO. 1 DRIVER
B5	K13 18YL/WT	FUEL INJECTOR NO. 3 DRIVER
B6	K15 18PK/BK	FUEL INJECTOR NO. 5 DRIVER
B7	-	-
B8	-	-
B9	-	-
B10	K20 18DG	GENERATOR FIELD DRIVER
B11	K54 18OR/BK (2.5L A-3)	-
B12	K16 18LG/BK (4.0I)	FUEL INJECTOR NO. 6 DRIVER
B13	K54 18OR/BK (2.5L)	TORQUE CONVERTER CLUTCH SOLENOID CONTROL
B14	-	-
B15	K12 18TN	FUEL INJECTOR NO. 2 DRIVER
B16	K14 18LB/BR	FUEL INJECTOR NO. 4 DRIVER
B17	-	-
B18	-	-
B19	-	-
B20	-	-
B21	-	-
B22	-	-
B23	G60 18GY/YL	ENGINE OIL PRESSURE SENSOR SIGNAL
B24	-	-
B25	-	-
B26	-	-
B27	G7 18WT/OR	VEHICLE SPEED SENSOR SIGNAL
B28	-	-
B29	-	-
B30	-	-
B31	K6 18VT/OR	5 VOLT SUPPLY
B32	-	-



POWERTRAIN CONTROL MODULE C3 - GRAY 32 WAY		
CAV	CIRCUIT	FUNCTION
C1	C12 18DB/DP	A/C COMPRESSOR CLUTCH RELAY CONTROL
C2	C27 18DB/DP	RADIATOR FAN RELAY CONTROL
C3	V51 18DB/DP	AUTOMATIC SHIFT (AMN) RELAY CONTROL
C4	V36 18TW/FF	SPEED CONTROL THROTTLE SEALING CONTROL
C5	V36 18LG/FF	SPEED CONTROL THROTTLE SEALING CONTROL
C6	-	-
C7	-	-
C8	-	-
C9	-	-
C10	K196 18WT/G (4.0L)	LEAK DETECTION PUMP RELAY/IDLE CONTROL
C11	V36 18TW/FF	SPEED CONTROL POWER SUPPLY
C12	A142 18LG/FF	AUTOMATIC SHIFT (AMN) RELAY OUTPUT
C13	-	-
C14	K196 18LG	BATTERY TEMPERATURE SENSOR SIGNAL
C15	K198 18TW/L (4.0L)	LEAK DETECTION PUMP SWITCH SENSE
C16	-	-
C17	-	-
C18	-	-
C19	K31 18BK	FUEL PUMP RELAY CONTROL
C20	K52 18PK/BK	EVAPORATIVE EMISSION SOLENOID CONTROL
C21	-	-
C22	C22 18DB/WT	A/C SWITCH SENSE
C23	C90 18LG	A/C SELECT INPUT
C24	K29 18WT/PK	BRAKE SWITCH SENSE
C25	K72 18DG/OR	GENERATOR DRIVER
C26	K226 18DB/LG	FUEL PUMP RELAY CONTROL
C27	D21 18PK	SCI TRANSMIT
C28	D2 18WT/BK	CCD BUS (-)
C29	D20 18LG/BK	SCI RECEIVE
C30	D1 18VT/BR	CCD BUS (+)
C31	-	-
C32	V37 18RD/LG	SPEED CONTROL SWITCH SIGNAL

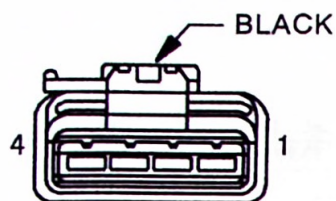


RADIATOR FAN MOTOR - LT. GRAY 2 WAY		
CAV	CIRCUIT	FUNCTION
1	C25 12LB	RADIATOR FAN RELAY OUTPUT
2	Z1 12BK	GROUND



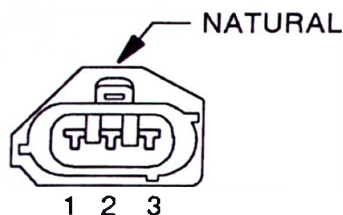
RIGHT SPEED CONTROL SWITCH - 2 WAY		
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR RETURN
2	V37 20RD/LG	SPEED CONTROL SWITCH SIGNAL

CONNECTOR PINOUTS



VEHICLE SPEED
CONTROL SERVO

VEHICLE SPEED CONTROL SERVO - BLACK 4 WAY		
CAV	CIRCUIT	FUNCTION
1	V36 18TN/RD	SPEED CONTROL VACUUM SOLENOID CONTROL
2	V35 18LG/RD	SPEED CONTROL VENT SOLENOID CONTROL
3	V30 20DB/RD	SPEED CONTROL ON/OFF SWITCH OUTPUT
4	Z1 18BK	GROUND



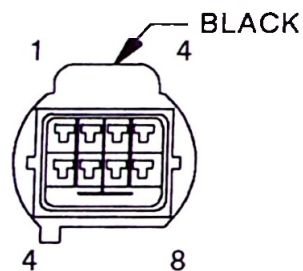
THROTTLE
POSITION
SENSOR

THROTTLE POSITION SENSOR - NATURAL 3 WAY		
CAV	CIRCUIT	FUNCTION
1	K167 20BR/YL	SENSOR RETURN
2	K22 180R/DB (2.5L)	THROTTLE POSITION SENSOR SIGNAL
2	K22 200R/DB (4.0L)	THROTTLE POSITION SENSOR SIGNAL
3	K7 200R	5 VOLT SUPPLY



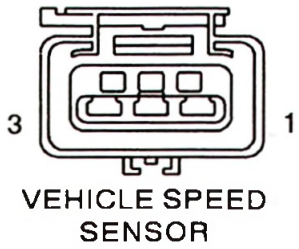
TORQUE CONVERTER
CLUTCH SOLENOID
(2.5L A/T)

TORQUE CONVERTER CLUTCH SOLENOID (2.5L A/T) - 2 WAY		
CAV	CIRCUIT	FUNCTION
A	F20 18WT	FUSED IGNITION SWITCH OUTPUT (ST-RUN)
B	K54 180R/BK	TORQUE CONVERTER SOLENOID CONTROL



TRANSMISSION
CONTROL ASSEMBLY

TRANSFER CONTROL ASSEMBLY - BLACK 8 WAY		
CAV	CIRCUIT	FUNCTION
1	T52 20RD/BK	INPUT SPEED SENSOR SIGNAL
2	T60 200R/WT	TRANSMISSION SOLENOID A
3	T19 20WT	TRANSMISSION SOLENOID B
4	T22 20DB/WT	TRANSMISSION SOLENOID C (LOCK-UP)
5	T31 20VT/LG	INPUT SPEED SENSOR GROUND
6	T13 20DB/BK	OUTPUT SPEED SENSOR GROUND
7	T14 20LG/WT	OUTPUT SPEED SENSOR SIGNAL
8	-	-



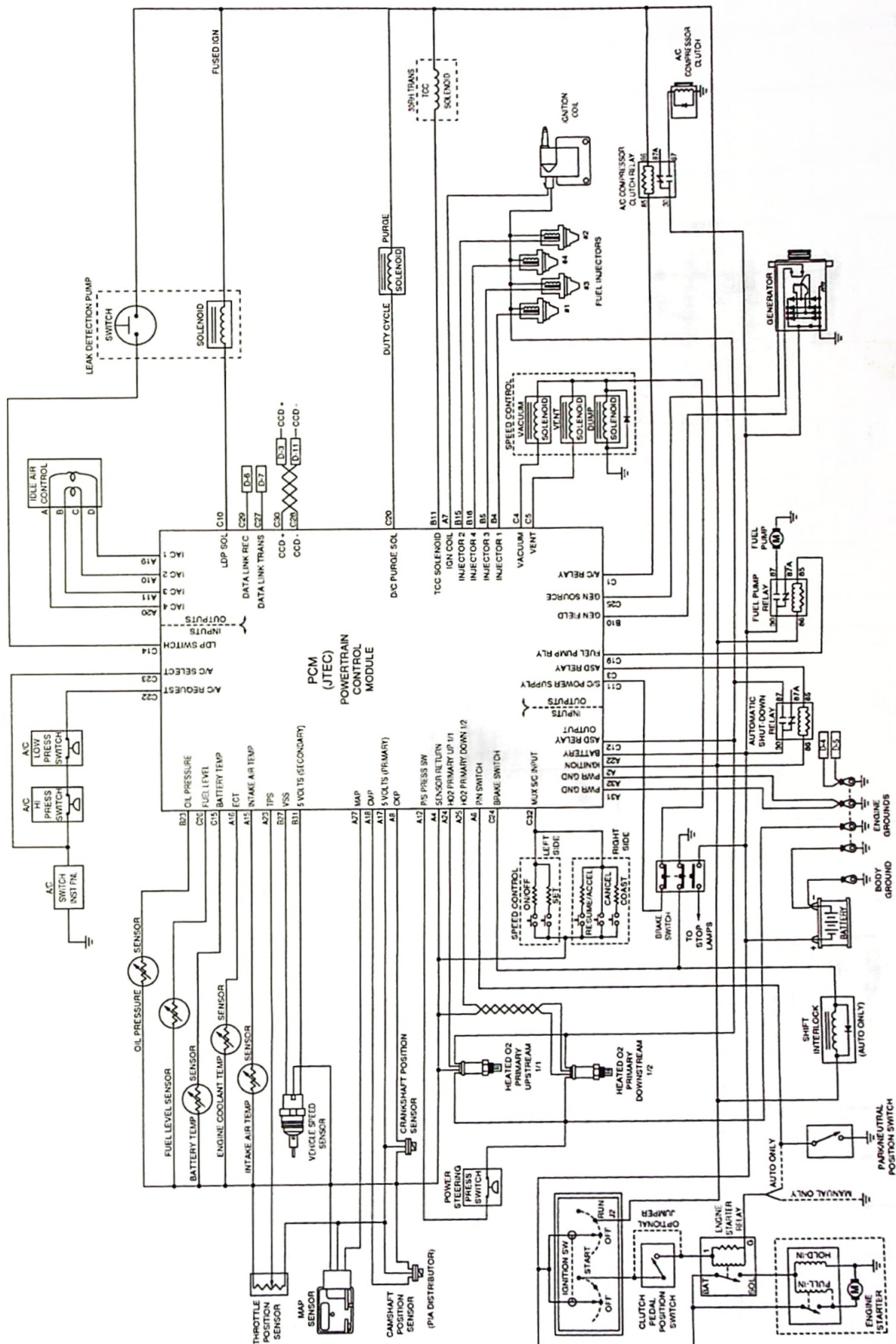
VEHICLE SPEED SENSOR - 3 WAY		
CAV	CIRCUIT	FUNCTION
1	K6 18VT/OR	5V SUPPLY
2	K167 18BR/YL	SENSOR RETURN
3	G7 18WT/OR	VEHICLE SPEED SENSOR SIGNAL

NOTES

CONNECTOR
PINOUTS

10.0 SCHEMATIC DIAGRAMS

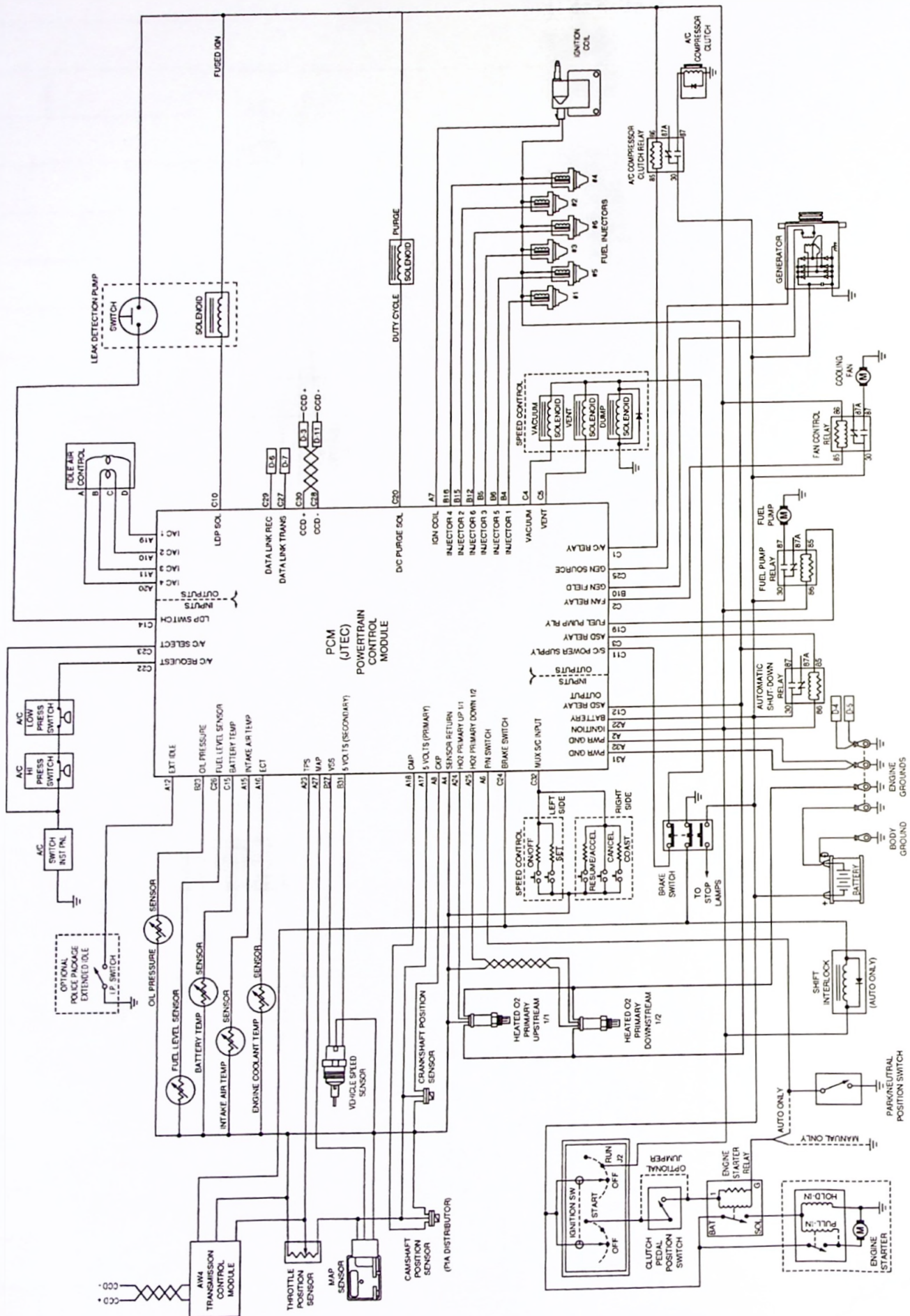
10.1 1999 JEEP XJ 2.5L JTEC SYSTEM



80ue838c

SCHEMATICS

10.2 1999 JEEP XJ 4.0L JTEC SYSTEM



80ae838d

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Transmission _____ Vehicle Mileage _____ MDH _____

Diagnostic Procedure _____ Book No. _____ Page _____

Comments/recommendations (if necessary, draw sketch)

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